Appendix C. Flow Budget, In-Flow Schematic and Out-Flow Schematic Lower Payette River, 1996

Station to Station Redrawals and Returns, August 1996
Estimated Return Flow. Model has not been verified,

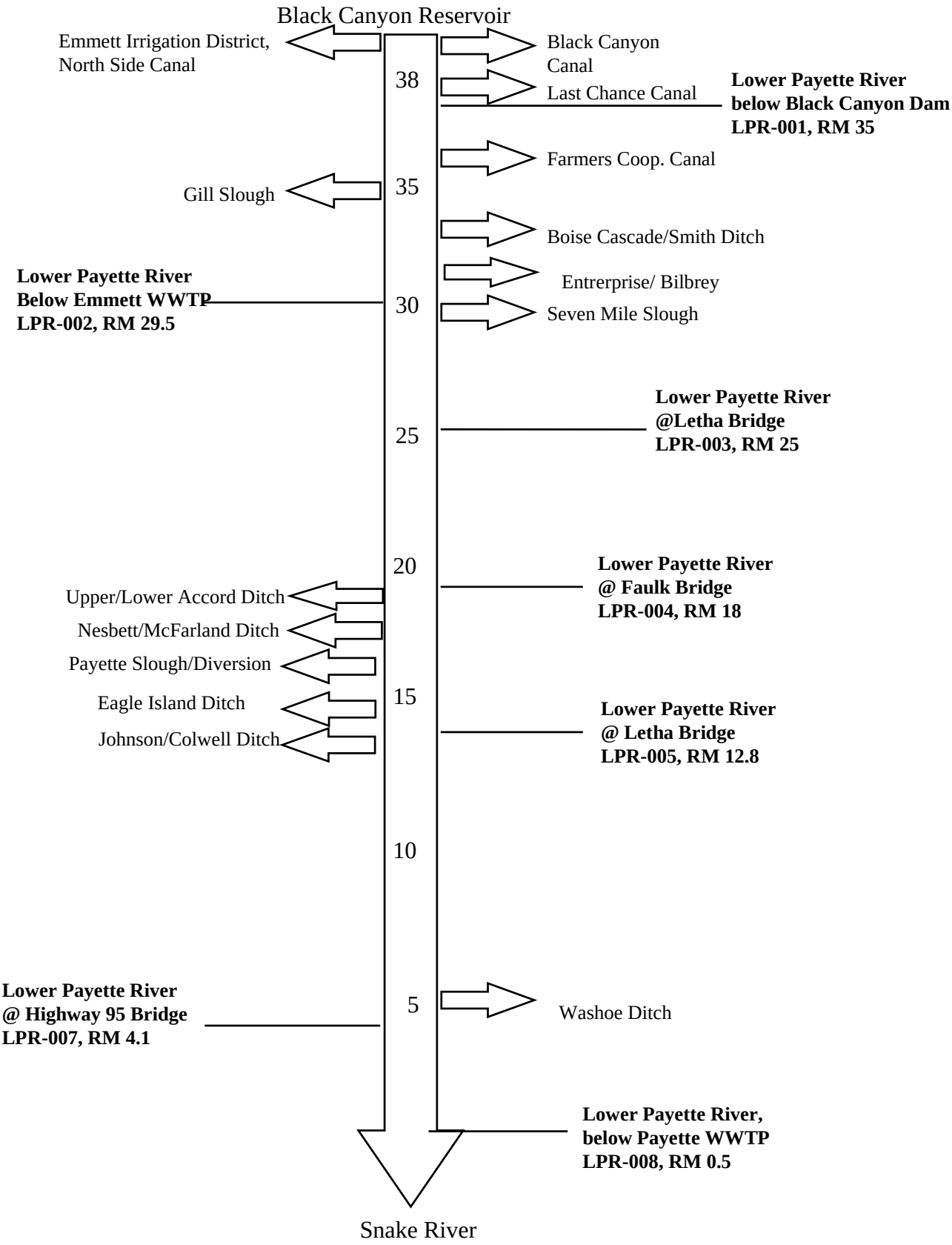
	Identified	Measured	Estimated	Withdrawals	Return
	Sourse	Flow	Flow		
	Diversion/Return	cfs	cfs	cfs	cfs
LPR-001					
RM 38		1554			
	Last Chance			109	
	Farmer's			369	
	Enterprise/Bilbrey			98	
	Emmett WWTP				5
	Plaza				7
	Mesa				11
	Big 4				36
	Ground Water*				80
	Misc.			20	43
Total				596	182
LPR-002					
RM 29.5			1140		
	Pioneer				6
	Beacon				13
	7 Mile Slough			367	
	Tunnell #7				32
	Ground Water*				43
	Misc			20	23
Total				387	116
LPR-003					
RM 25		949	869		
	Silverleaf				20
	Sand Hollow				4
	7 Mile Slough				43
	Accord Ditches			21	
	Countyline				26
	Ground Water*				43
	Misc.			20	8
Total				41	143

*Estimated Ground Water Return at 9.5 cfs/mile of River

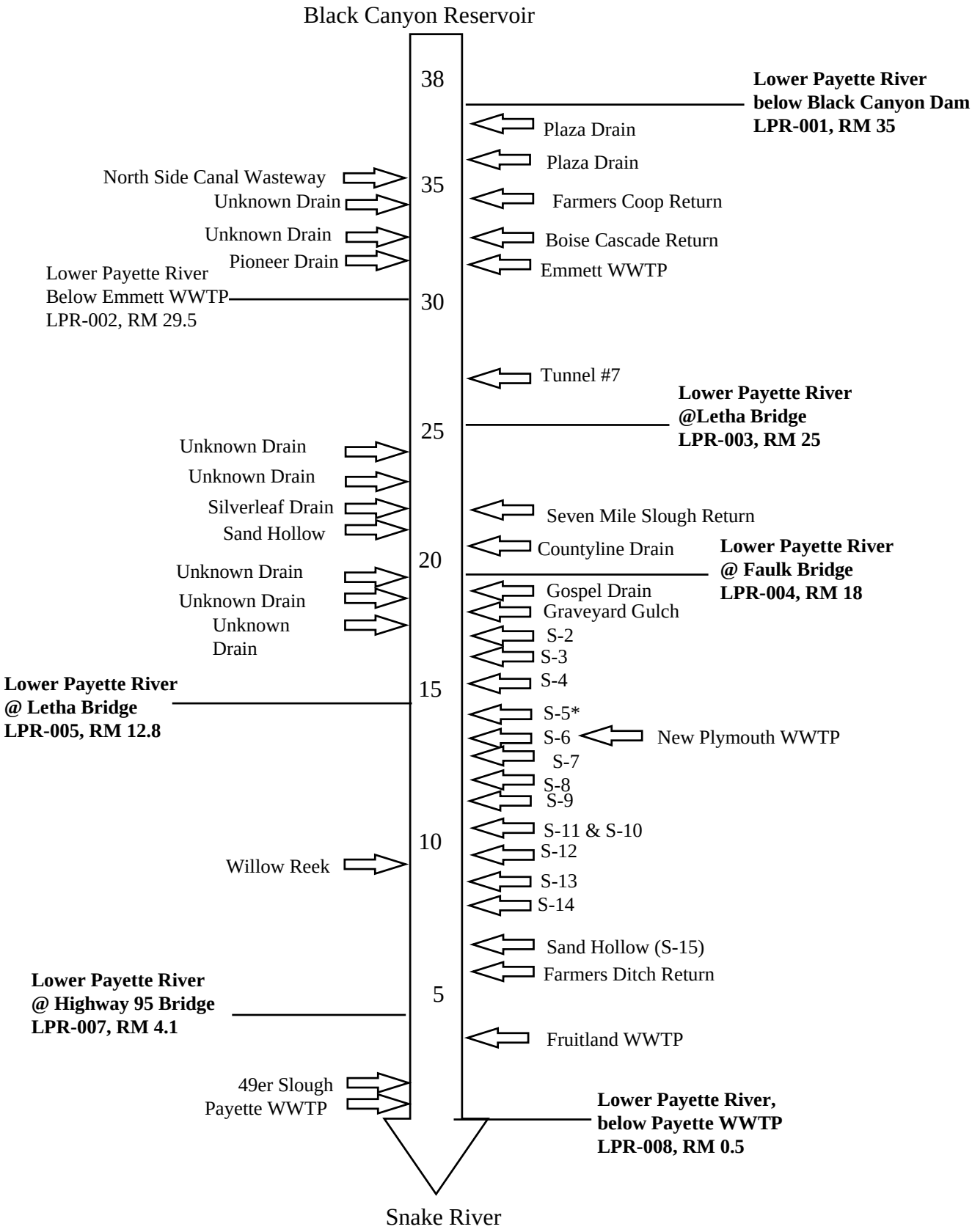
Station to Station Redrawals and Returns, August 1996
Estimated Return Flow. Model has not been verified,

LPR-004					
RM 18			971		
	Nesbitt/McFar Ditch			12	
	Low Payette Ditch			256	
	Eagle Island			30	
	J/C Ditch			42	
	Bissel Cr.				17
	S-1 (Graveyard)				38
	S-2				27
	S-3				13
	GroundWater*				47
	Misc			20	25
Total				360	167
LPR-005					
RM 13			778		
	Simplot Pumps			50	
	Washoe Ditch			20	
	S-4				13
	S-5				54
	S-6				22
	S-7				7
	S-8				21
	S-9				7
	S-10				17
	S-11				7
	S-12				8
	S-13				47
	S-14				17
	S-15				27
	Willow Cr.				69
	49er Slough				45
	GroundWater*				47
	Misc.			20	45
Total				90	453
LPR-007					
RM 4		1287	1141		
	Fruitland WWTP				0.2
	Payette WWTP				4.6
	49er Slough				45
	GroundWater*				33
	Misc.				18
Total				0	100
LPR-008					
RM 0.5			1242		

*Estimated Ground Water Return at 9.5 cfs/mile of River



Major Diversion Sites on the Lower Payette River
Diagram is not to scale, and should be used only as reference to river locations.



Major Irrigation Water Return Drains and Tributaries
Diagram is not to scale, and should be used only as reference to river locations.

Appendix D. Lower Payette River Monitoring Sites

Table 1. Historic BOR Monitoring, As Per the 1975 Study.

Station Description	Agency	Agency ID	STORET Number	Year(s) of Monitoring	Latitude	Longitude
Payette River near Emmett, Idaho	BOR	EMM001		1974	43°56'18"	116°26'45"
Combine Drain and Tunnel #7	BOR	EMM002		1974	43°52'45"	116°37'10"
Bissel Creek	BOR	EMM003		1974	43°53'45.0	116°37'00"
Graveyard Wasteway	BOR	EMM004		1974	43°57'00"	116°44'20"
Drain ½ mi. East of Graveyard Wasteway	BOR	EMM004A		1974	43°57'00"	116°43'40"
Payette River near Faulk Bridge	BOR	EMM005		1974	43°57'15"	116°43'00"
B Lateral Drain	BOR	EMM006		1974	43°57'10"	116°44'55"
Cemetery Drain	BOR	EMM007		1974	43°58'50"	116°48'50"
Drain Near New Plymouth	BOR	EMM008		1974	43°58'35"	116°50'10"
Cr. Near New Plymouth	BOR	EMM008A		1974	43°00'38"	116°5 ‘16"
Sand Hollow Cr. Near Fruitland	BOR	EMM009		1974	43°01'30"	116°53'55"
Payette River near Payette	BOR	EMM010		1974	43°02'35"	116°55'25"
Big Willow Creek @ Tom Pence Ranch	BOR	EMM017		1974	43°00'20"	116°46'15"

Table 2. Historic BOR and USGS Monitoring.

Station Description	Agency	Agency ID	Year(s) of Monitoring	Latitude	Longitude
Payette R. Below Black Canyon Dam	BOR	EMM025	numerous since 1925	43°55'50"	116°26'30"
Payette River 2 Letha Bridge	BOR	EMM015	Numerous since 1978	43°53'47"	116°37'33"
Payette River at Payette (Highway 95)	USGS	13251000	Numerous since 1935	44°02'33"	116°55'27"

Table 3. DEQ-WAG Monitoring Sites, 1996 (Bacteria), 1997-98 (Water Column Chemistry)

Station Description	Agency	Agency ID	Year(s) of Monitoring	Latitude	Longitude
Payette R. Below Black Canyon Dam	DEQ-WAG	LPR-001	1996, 97-98	43°55'50"	116°26'30"
Payette River 1 mile below Emmett WWTP	DEQ-WAG	LPR-002	1996, 97-98		
Payette River @ Letha Bridge	DEQ-WAG	LPR-003	1996, 97-98	43°53'47"	116°37'33"
__Payette River @ Faulk Bridge	DEQ-WAG	LPR-004	1996, 97-98	43°57'15"	116°43'00"
Payette River @ Blacks Bridge (Willow Creek Road)	DEQ-WAG	LPR-005	1996, 97-98		
Payette River at Payette (Highway 95	DEQ-WAG	LPR-007	1996, 97-98	44°02'33"	116°55'27"
Payette River ½ mile below Payette WWTP (South Side of River)	DEQ-WAG	LPR-008	1996, 97-98		

Table 4. DEQ-Payette SWCD Monitoring Sites, As Per the 1991, 92 & 93 Study.

Station Description	Agency	Agency ID	STORET Number	Year(s) of Monitoring	Latitude	Longitude
Drain @ Payette River, River Mile 16.5	DEQ-SWCD	S-1	2040487	1991	43° 57'29"	116 45'23"
Drain @ Payette River, River Mile 15.75 (South Side)	DEQ-SWCD	S-2	2040488	1991-92&93	43 57'42"	116 45'23"
Drain @ Payette River, River Mile 15.25 (South Side)	DEQ-SWCD	S-3	2040489	1991-92&93	43°57'52	116°45'42"
Drain 0.25 Mi NE of Kenedy Cemetery	DEQ-SWCD	S-4	2040490	1991	43 58'24"	116 47'10"
0.25 miles Downstream of Willow Creek Road Bridge (Blacks Bridge)	DEQ-SWCD	S-5	2040491	1991-92&93	44°59'39"	116°47'54"
0.75 Mi W of Adams Rd	DEQ-SWCD	S-6	2040492	1991	44 00'03"	116 48'55"
Drain 0.5 mi W of Adam Rd.	DEQ-SWCD	S-7	2040493	1991	44 00'10"	116 49'16"
Drain 0.25 mi W of Adam Rd	DEQ-SWCD	S-8	2040494	1991	44 00'14"	116 49'29"
Drain @ Payette River, RM 10	DEQ-SWCD	S-9	2040495	1991	44 00'36"	116 49'57"
0.2 Mile north of River Road	DEQ-SWCD	S-10	2040496	1991-92&93	44°00'24"	116°50'11"
Drain 0.2 mi N of River Rd.	DEQ-SWCD	S-11	2040497	1991	44 00'24"	116 50'14"
Payette River @ River Road	DEQ-SWCD	S-12	2040498	1991-92&93	44°01'46"	116°52'44"
0.5 Mile North of River Road	DEQ-SWCD	S-13	2040499	1991-92&93	44°01'21"	116°52'08"
Drain 0.25 N of River Rd	DEQ-SWCD	S-14	2040450	1991	44 01'17"	116 52'21"
Sand Hollow Drain at 16th St.	DEQ-SWCD	S-15	2040501	1991	44 01'36"	116 53'58"
Willow Creek @ Highway 52	DEQ-SWCD	C-7	2040486	1991-92&93	44 01'46	116 50'27"

Table 5. Historic EPA Monitoring Sites, As Per the 1975 Study.

Station Description	Agency	Agency ID	STORET Number	Year(s) of Monitoring	Latitude	Longitude
Payette River Below Black Canyon Dam	EPA`		153681	1975	43^{O}55'50"	116^{O}26'22"
Froze Dog Drain near Emmett	EPA		153682	1975	43^{O}53'22"	116^{O}27'09"
Payette River 100ft below Payette WWTP	EPA		153741	1975	44^{O}04'51"	116^{O}56'51"
Payette River @ Emmett (Hwy 52)	EPA		153683	1975	44^{O}04'47"	116^{O}29'57"
Emmett WWTP	EPA		153756	1975	43^{O}52'45"	116^{O}30'30"
Haw Creek 1 mi west of Emmett	EPA		153684	1975	43^{O}52'47"	116^{O}32'07"
Bissel Cr. 2.5 mi east of Letha	EPA		153687	1975	43^{O}53'51"	116^{O}36'55"
Tunnel #7 @ Vanderdassen Rd.	EPA		153685	1975	43^{O}53'07"	116^{O}37'17"
Payette River @ Letha Bridge	EPA		153686	1975	43^{O}53'49"	116^{O}37'36"
Drain @ West Hanna Rd.	EPA		153732	1975	43^{O}54'55"	116^{O}39'42"
Hanna Drain	EPA		153733	1975	43^{O}55'37"	116^{O}40'39"
Drain nr Bank Payette River, (RM 21)	EPA		153734	1975	43^{O}55'47"	116^{O}40'59"
Sand Hollow 3 mi East of Letha	EPA		153735	1975	43^{O}55'58"	116^{O}41'19"
Sevenmile Slough 1.3 mi NW of Letha	EPA		153688	1975	43^{O}54'55"	116^{O}40'10"
Farmer’s Coop Wasteway	EPA		153689	1975	43^{O}56'02"	116^{O}42'40"
Drain E. Bank Payette River (RM 18.9)	EPA		153736	1975	43^{O}56'39"	116^{O}42'20
Payette R. @ Faulk Bridge	EPA		153690	1975	43^{O}57'16"	116^{O}43'00"

Table 5. Historic EPA Monitoring Sites, As Per the 1975 Study.

Station Description	Agency	Agency ID	STORET Number	Year(s) of Monitoring	Latitude	Longitude
B Laterial 1 mi East of Halmonton Cr.	EPA		153691	1975	43°57'09"	116°44'56"
Drain near Halmonton Cr.	EPA		153692	1975	43°57'36	11644'56
Drain S. Bank Payette River (RM 15.3)	EPA		153706	1975	43°57'50"	116°45"42"
Payette River nr New Plymouth Hwy 52	EPA		153693	1975	43°58'09	116°46'30"
Drain S. Bank Payette River (RM 13.42)	EPA		133739	1975	43°58'50"	116°47'08"
Drain S. Bank Payette River (RM 13.4)	EPA		133740	1975	43°58'51"	116°47'10"
Payette R. @ Willow Cr. Road Bridge	EPA		153694	1975	43°59'26"	116°47'42"
Cemetery Drain near New Plymouth	EPA		153695	1975	43°58'44"	116°47'53"
New Plymouth WWTP	EPA		153755	1975	43°59'00"	116°47'47"
Drain South Side of Payette River (RM 9.9)	EPA		153696	1975	43°00'31"	116°47'00"
Drain South Side of Payette River (RM 9.8)	EPA		153748	1975	44°00'31"	116°49'51"
Drain South Side Payette River (RM 9.7)	EPA		153697	1975	44°00'39"	116°50'10"
Drain South Bank Payette River(RM 9.6)	EPA		153698	1975	44°00'42"	116°50'50"

Table 5. Historic EPA Monitoring Sites, As Per the 1975 Study.

Station Description	Agency	Agency ID	STORET Number	Year(s) of Monitoring	Latitude	Longitude
Drain South Bank Payette River (RM 9.3)	EPA		153699	1975	44°00'52"	116°50'43
Big Willow Creek 4 mi SE of Payette	EPA		153745	1975	44°01'34"	116°50'27"
Drain Left Bank Payette River (RM 7.5)	EPA		153747	1975	44°01'03"	116°52'15'
Drain 2 mi E Fruitland (RM 7.3)	EPA		153700	1975	44°01'06"	116°52'26"

Table 5. Historic EPA Monitoring Sites, As Per the 1975 Study. Cont.

Station Description	Agency	Agency ID	Year(s) of Monitoring	STORET #	Latitude	Longitude
Sand Hollow near Fruitland	EPA		153701	1975	44°01'31"	116°53'58"
Farmer's Ditch Ingrad near Payette	EPA		153702	1975	44°01'47"	116°55'19"
Fruitland WWTP	EPA		153753	1975	44°02'15"	116°55'32"
Payette River @ Payette (Hwy 95)	EPA		153703	1975	44°02'33"	116°55'28"
Payette River @ Payette (Kiawnis Park)	EPA		153704	1975	44°03'35"	116°56'04"
49 Slough @Kiawnis Pary	EPA		153705	1975	44°04'05"	116°56'07"
Payette WWTP	EPA		153752	1975	44°05'01"	116°57'05"

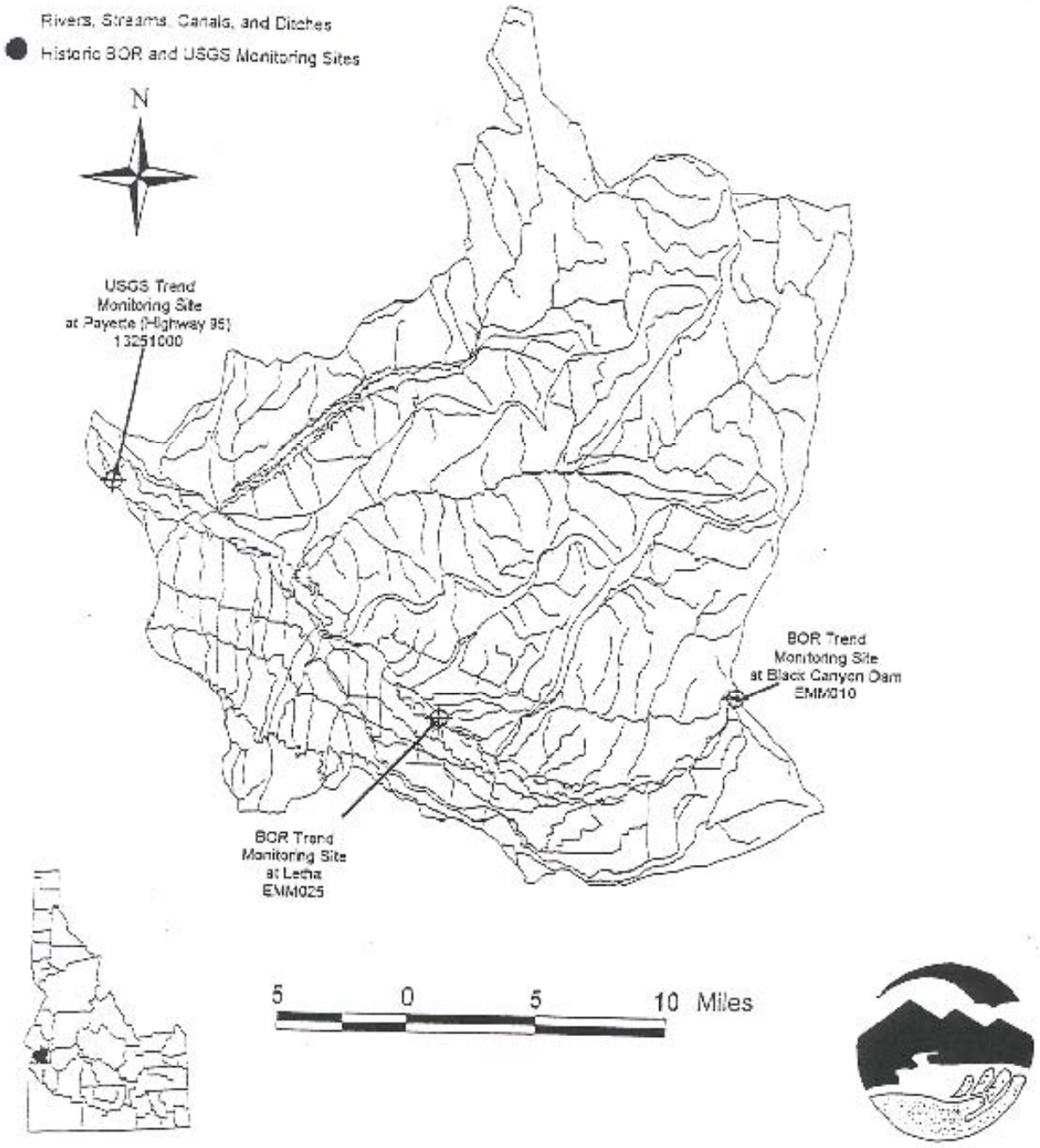
Table 6. Idaho Department of Agriculture, 1996-97 Study.

Station Description	Agency	Agency ID	Year(s) of Monitoring	STORET #	Latitude	Longitude
Emmett Irrigation District Canal	IDA		1996-97			
Pioneer Drain	IDA		1996-97			
Mesa Drain	IDA		1996-97			
Big 4 Drain	IDA		1996-97			
Beacon Drain	IDA		1996-97			
Bissel Creek	IDA		1996-97			
Tunnel #7	IDA		1996-97			
Silverleaf Drain	IDA		1996-97			

Table 6. Idaho Department of Agriculture, 1996-97 Study.

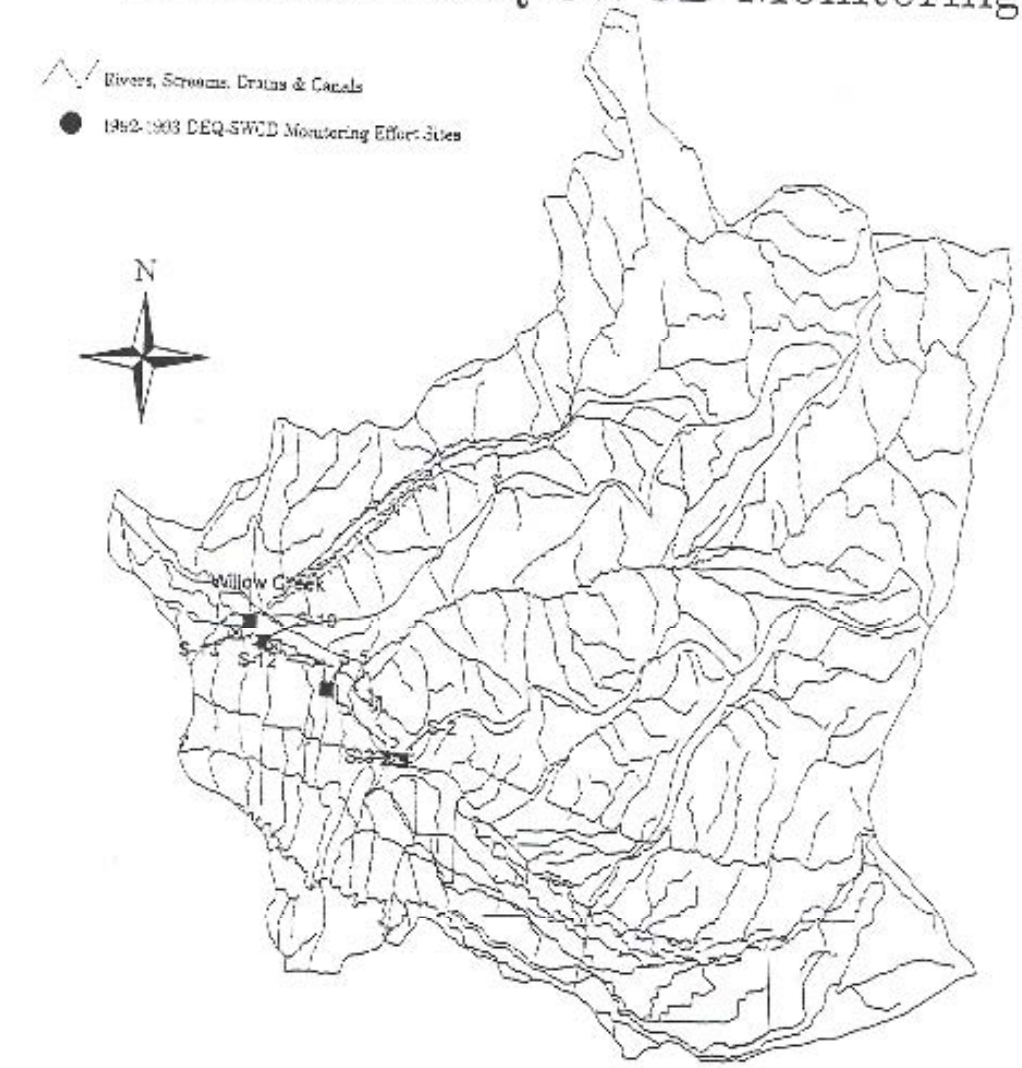
Station Description	Agency	Agency ID	Year(s) of Monitoring	STORET #	Latitude	Longitude
Sand Hollow	IDA		1996-97			
Seven Mile Slough	IDA		1996-97			
County Line Drain	IDA		1996-97			
Drain @ Payette River, RM 15.75	IDA	S-2	1997	2040488		
Drain @ Payette River, RM 15.25	IDA	S-3	1997	2040489	43°7'52"	116°45'42"
0.25 Miles Downstrem of Willow Creek Road (Blacks Bridge)	IDA	S-5	1997	2040491	43°59'39"	116°47'54"
0.2 Miles North of River Road	IDA	S-10	1997	2040496	44°00'24	116°50'11"
Payette River @ River Road	IDA	S-12	1997	2040498	44°01'46"	116°50'44"
0.5 Miles North of River Road	IDA	S-13	1997	2040499	44°01'21"	116°52'08"
Sand Hollow Creek	IDA	S-15	1997	2040501		
Willow Creek	IDA	C-7	1997			
49er Slough	IDA		1997			

LOWER PAYETTE RIVER
TMDL PROJECT
Historic BOR-USGS Monitoring Sites



LOWER PAYETTE RIVER TMDL PROJECT

1992-1993 DEQ-SWCD Monitoring Sites



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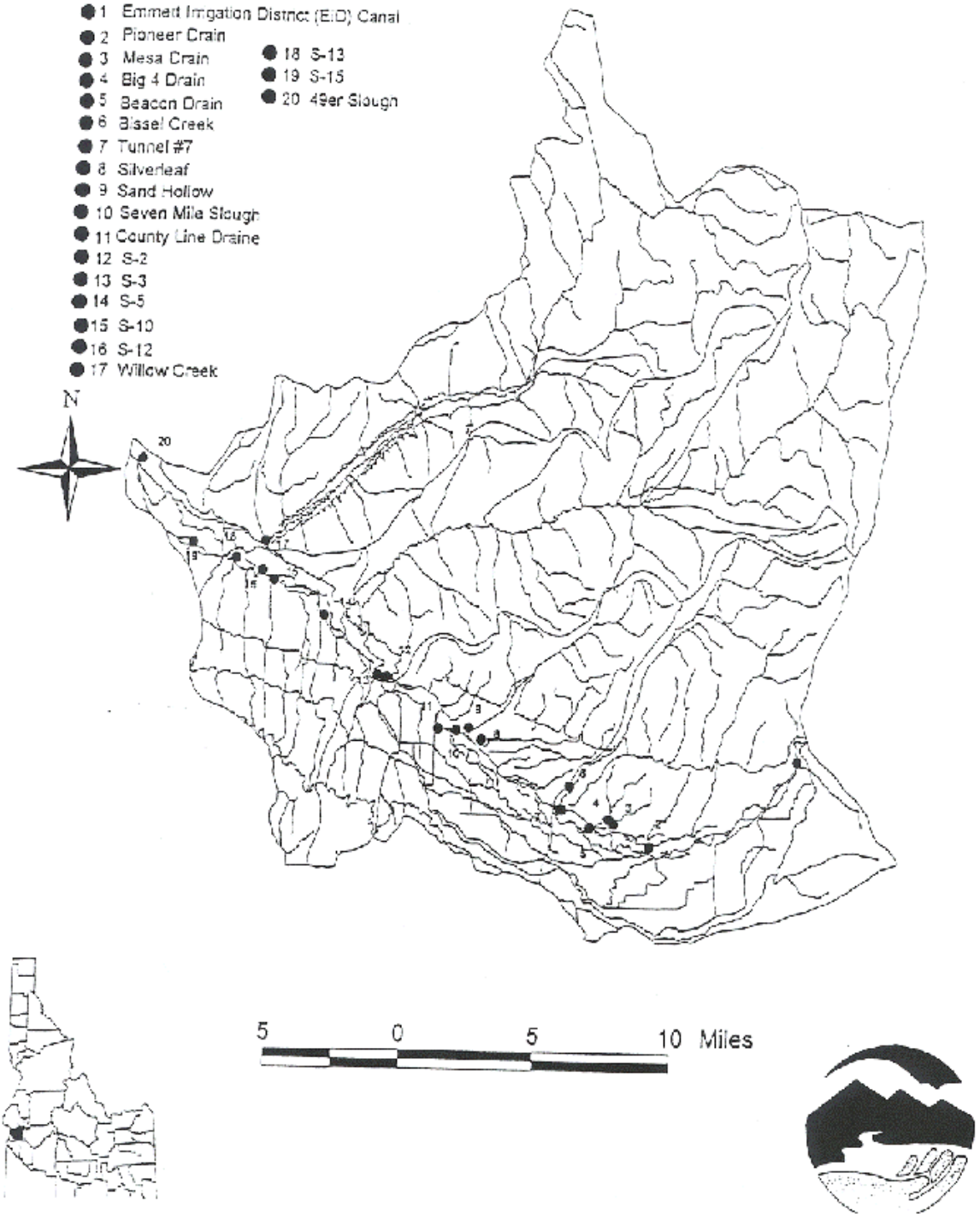
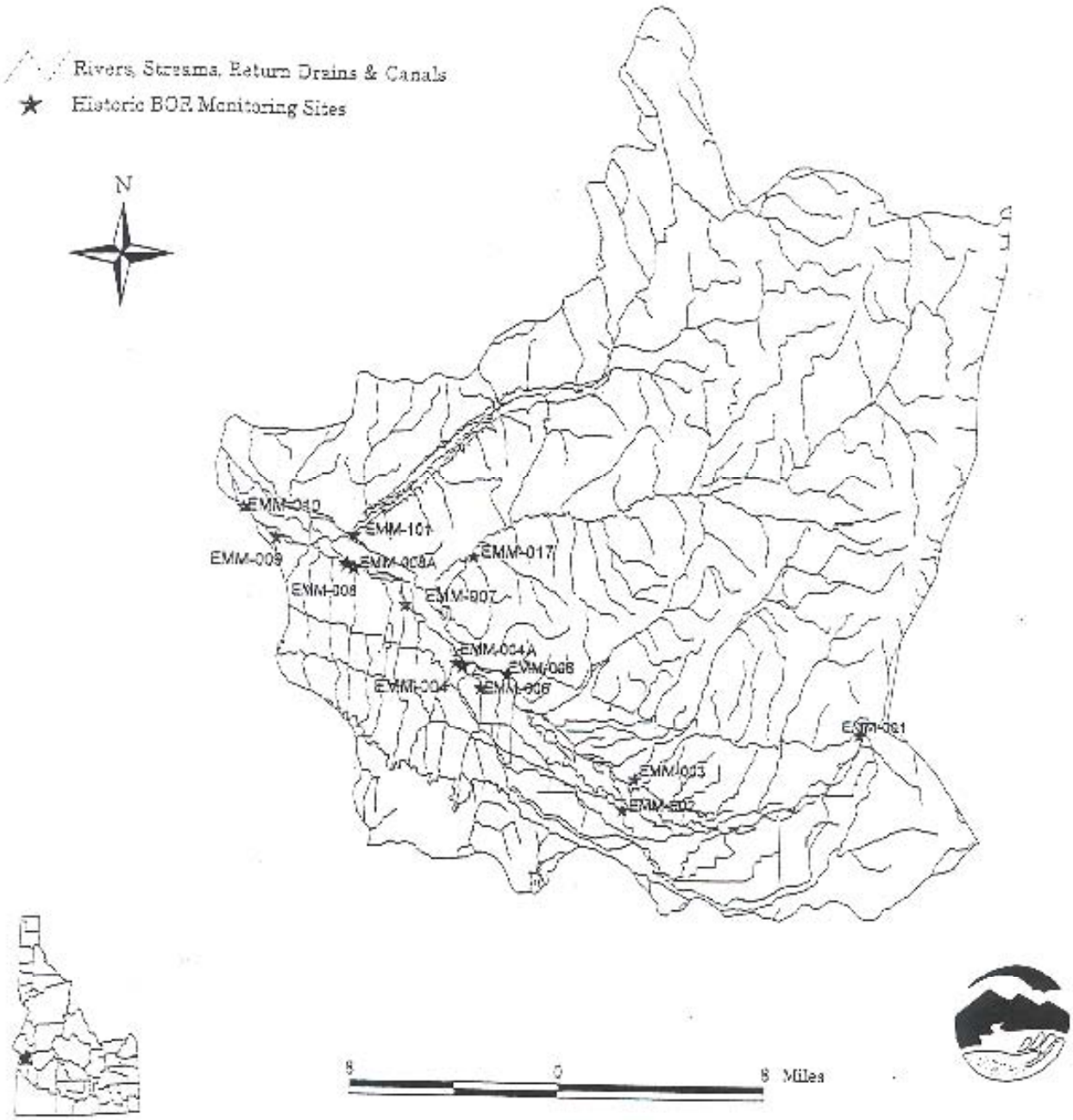
LOWER PAYETTE RIVER TMDL PROJECT

1996-1997 IDA Monitoring Sites



LOWER PAYETE RIVER TMDL PROJECT
Historic BOR Monitoring Sites

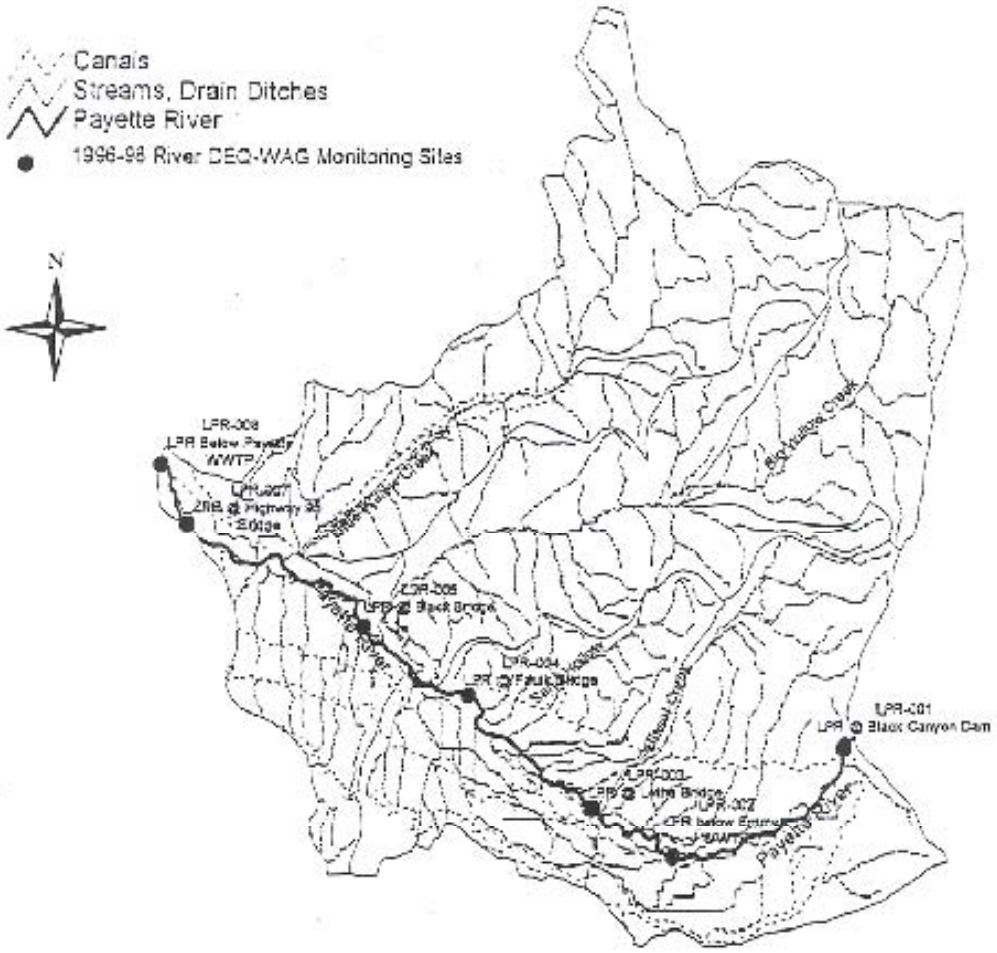


LOWER PAYETTE RIVER TMDL PROJECT NPDES Facilities

* NPDES Permitted Facilities
Dense Urban Areas

0 5 0 5 10 Miles

Lower Payette River SBA
1996-98 River Monitoring Sites



Appendix E. Point Source Description and Monitoring Requirements

1.0. Point Source Description and Reporting Requirements

Most municipal wastewater treatment plants (WWTP) are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit to discharge treated wastewater to the waters of the United States. The NPDES permit is issued by the United States Environmental Protection Agency (USEPA). In Idaho, the state does not have primacy over NPDES permits, but does receive a copy of the Discharge Monitoring Reports (DMRs) to assist in evaluating water quality impacts to the receiving waters and compliance with the permit. The State of Idaho, Division of Environmental Quality (DEQ), does review and approve all system facility plans and modifications. DEQ also inspects facilities once a year.

1.1 City of Emmett, Wastewater Treatment Plant

USEPA-NPDES # ID-002031-1; Issued: October, 1990

The City of Emmett operates a wastewater treatment facility downstream from the City of Emmett, at approximately River Mile (RM) 31.5. The facility was constructed in 1987, with modifications completed in 1994. Wastewater is treated through the use of aeration and facultative lagoons. Gas chlorination is used before discharging into the Payette River. The facility was designed to handle 2.8 million gallons per day (MGD). NPDES reporting requirements are listed in Table 1. The current NPDES permit issued in 1991 has expired and will be reissued at the completion of the TMDL.

Table 1. City of Emmett WWTP, NPDES Reporting/Monitoring Requirements.

Parameter/Frequency	Daily	Weekly	Monthly
BOD, Influent (lbs/day)		X	30 day average
BOD, Effluent (lbs/day)		X	30 day average
BOD, (% Reduction)		X	Monthly Average
pH (su)		X	Weekly
Fecal Coliform (CFU per/100ml)		X	Weekly Average
Total Suspended Solids (TSS)(mg/l or lbs/day)		X	Weekly Average
Total Chlorine Residual (mg/l)		X	Weekly Average
Flow thru plant (MGD)	X		Continuous

Over the last few years the City of Emmett has taken measures to reduce the amount of infiltration into its sewer lines, thus reducing the amount of wastewater requiring treatment. More work on infiltration reduction is planned.

The City has voluntarily increased their monitoring to include the lower Payette River. This effort includes upstream and downstream of the facility's discharge point and includes a variety of nutrients, bacteria and solids. In 1998 the City began monitoring for E.coli bacteria in anticipation of future changes in effluent monitoring requirements. E. coli monitoring is also being conducted in the river.

1.2. Letha

The City of Letha does not discharge to the waters of the United States, so a NPDES permit is not required. No monitoring is done.

1.3. City of New Plymouth Wastewater Treatment Plant
USEPA-NPDES # ID-002038-9; Issued November, 1990

The City of New Plymouth facility uses facultative lagoons for primary treatment. In 1990, the USEPA determine the discharge from this facility to be minor and did not require disinfection of the discharge water. The facility discharges to an irrigation water return drain located on the east side of the 4th cell. This irrigation water return drain ditch connects with another drain located on the west side of the lagoons. This drain forms drain S-6, which then discharges to the lower Payette River downstream of Blacks Bridge (LPR-005). Discharge location is at approximately RM 11. Discharges are seasonal with most discharges occurring in August, September and the early part of October. The remainder of the year, evaporation usually exceeds the influent. Monitoring is usually limited to periods of discharge only.

Table 2. shows the City of New Plymouth WWTP's DMR requirements. A DMR is also required even when the facility is not discharging, but no monitoring is conducted.

Table 2. City of New Plymouth WWTP, NPDES Reporting\Monitoring Requirements

Parameter/Frequency	Daily	Weekly	Comments
BOD, Influent (lbs/day)			once a month during discharge
BOD, Effluent (lbs/day)			same as above
BOD, (% Reduction)			same as above
pH (su)			same as above
Fecal Coliform (CFU per/100ml)			same as above
Total Solids (mg/l)			same as above
Flow thru plant (MGD)	X		Limited Data Available

Actual discharge data is limited, but the facility is designed to release approximately 0.03 MGD during periods of discharge. Over the past few years, the city has increased their monitoring effort to characterize water quality in the effluent and receiving waters. Included in this monitoring effort are other parameters besides those required in the NPDES permit. These parameters included nutrients, bacteria and physical constituents (DO, temp, pH).

1.4. City of Fruitland Wastewater Treatment Plant
USEPA-NPDES # ID-002119-9; Issued: September, 1993

The City of Fruitland has two wastewater treatment facilities. One facility (USEPA NPDES# ID-002033-8) discharges into the Snake River. The other is the Payette River Facility (USEPA NPDES# ID-002119-9). The Payette River facility discharges approximately 0.25-0.4 MGD to the lower Payette River. The discharge point is approximately one-half mile below the US Highway 95 Bridge at RM 3.9. Treatment consist of primary aeration and facultative lagoons, and rock filter. Disinfection, by chlorine gas, occurs before discharging into the Payette River.

The City of Fruitland-Payette River Facility receives both industrial wastewater from a food processing facility and from residential housing. The food processing facility can account for 25 to 50% of the total

inflow into the system.

The Fruitland-Payette River WWTP is unique for the Payette since the NPDES permit requires both WWTP effluent monitoring, and in river monitoring. Table 3 shows the NPDES reporting/monitoring requirements. Table 4 shows the in river monitoring to be conducted. Beside conducting the required lower Payette River NPDES monitoring, the City conducts river monitoring for other chemical, physical and biological parameters.

Table 3. City of Fruitland-Payette River WWTP, NPDES Reporting/Monitoring Requirements, influent-effluent.

Parameter/Frequency	Daily	Weekly	Others/Comments
BOD, Influent (lbs/day)		X	1 sample every 7 days
BOD, Effluent (lbs/day)		X	1 sample every 7 days
BOD, (% Reduction)			Monthly
pH (su)	X		5 samples a week
Fecal Coliform (CFU/100ml)		X	7 day average
Total Suspended Solids (TSS) (mg/l or lbs/day)		X	7 day average
Total Residual Chlorine (mg/l)	X		5 samples a week
Dissolved Oxygen (Effluent)	X		5 samples a week
Total Kjeldahl Nitrogen (mg/l)			Quarterly
Nitrate as N (mg/l)			Quarterly
Nitrite as N (mg/l)			Quarterly
Total Phosphorus (mg/l)			Quarterly
Diss. Ortho-Phosphorus (mg/l)			Quarterly
Ammonia as N (mg/l)		X	2 samples a month
Flow thru plant (MGD)	X		Continuous

Table 4. City of Fruitland-Payette River WWTP, NPDES Reporting/Monitoring Requirements, Payette River. January, May, August and September.

Parameter/Frequency	Daily	Weekly	Others/Comments
Total Ammonia as N (mg/l)			Quarterly
Temperature			Quarterly
pH (SU)			Quarterly

1.5 City of Payette Wastewater Treatment Plant
USEPA-NPDES # ID-002067-2; Issued: April, 1991
The City of Payette WWTP consists of an oxygenation ditch, secondary clarifiers and disinfection. Sludge drying beds are also located on site and receive sludge from the clarifiers. Sludge is then either transported to the local landfill or land applied. After disinfection (chlorination) the wastewater is discharged to the lower Payette River at RM 0.5. DMR records show the facility discharges approximately 1.2-2.2 MGD of treated effluent.

NPDES influent-effluent monitoring requirements are listed in Table 5. When the NPDES permit was issued in 1991, the USEPA required that the City of Payette WWTP conduct one year of in river monitoring. These in river monitoring requirements are listed in Table 6.

Table 5. City of Payette WWTP, NPDES Reporting/Monitoring Requirements, influent-effluent.

Parameter/Frequency	Daily	Weekly	Others/Comments
BOD, Influent (mg/l)		X	2 sample every 7 days
BOD, Effluent (mg/l)		X	2 sample every 7 days
BOD, (% Reduction)		X	2 sample every 7 days
pH (su)	X	X	5 samples a week
Fecal Coliform (CFU per/100ml)		X	2 samples a week
Total Suspended Solids (TSS) (mg/l or lbs/day)		X	2 samples a week
Total Solids Effluent (mg/l)		X	2 samples a week
Total Residual Chlorine (mg/l)	X		7 samples a week
Total Kjeldahl Nitrogen (mg/l)			Monthly
Nitrate as N (mg/l)			Monthly
Nitrite as N (mg/l)			Monthly
Total Phosphorus (mg/l)			Monthly
Ammonia as N (mg/l)		X	2 samples a month
Flow thru plant (MGD)	X		Continuous

Table 6. City of Payette WWTP, NPDES Reporting/Monitoring Requirements, Payette River. For one year beginning in 1991.

Parameter/Frequency	Daily	Weekly	Others/Comments
Total Ammonia as N (mg/l)			every 2 weeks, 1991
Total Phosphorus (mg/l)			monthly, ongoing
Nitrate as N (mg/l)			monthly, 1991
Nitrite as N (mg/l)			Quarterly, 1991
Total Kjeldahl Nitrogen (mg/l)			Quarterly, 1991
Temperature			every 2 weeks, 1991
pH (SU)			every 2 week, 1991

As with the other NPDES permits on the lower Payette River, the permit for the City of Payette has expired. A new permit will be issued upon development of the TMDL for the lower Payette River.

The city has an on-going effort to reduce infiltration into the sewer system. This consist of repairing manholes and replacing outdated sewer lines. The City is also conducting Total Phosphorus monitoring above and below the treatment plant outfall.

Appendix F. Bacteria Load Reductions Tables

Explanation of Spreadsheets

Table 1, explains the break down of the cell addresses used to develop the loading estimates and load reductions for the lower Payette River for fecal coliform bacteria. The spreadsheets are simply mass balance equations with die off rates determined for each segment based on distance traveled. Loading estimates are then calculated using die-off rates, distance traveled, input from; drains, creeks, and in river values; and subtraction from withdrawals. Table 1 shows cell addresses as related to the spreadsheets.

Tables 2 through 6 show expected load from station to station based on the mass-balance formulas explained in Table 1. The calculated load (CFU/sec) and levels (CFU/100ml) for both actual results and those projected are displayed. Flow data was obtained from either the BOR gaging sites, USGS sites, or from Appendix D. The SBA used estimated values based on a mass balance for withdrawals (canals and pumps) and input from drains and creeks.

Tables 7 through 12 show individual reductions needed by drains or tributaries.

Table 1. Explanation of Bacteria Loading Spreadsheet

Cell Addresses	Explanation or Formula
A1,2,3	Header for Station
A4,5,6-M4,5,6	Headers for Columns
A8	Preceding River Station (up river station)
A10	Header for Return Drains
A11-A20	Return Drains
A22, F22, I22, L22	Sub-total Return Drains
A24	Header For Withdrawals (Canals, Pumps)
A25-A33	Withdrawals
A35, F35, I35, L35	Sub-Total Withdrawals
A37, F37, I37, L37	Totals (F22+F35, I22+I35, L22+L35)
A38,39,40-M38,39,40	Headers for Downstream River Station
B8-B41	Flows: River, Drains or Withdrawals
C8-C41	Miles to next River Station
D8-D41	Travel Time (miles*5280ft/(3ft/s)/(60*60))
E8-E37	Existing Count (CFU) or Calculated from previous Station (CFU/100ml)
F8-F37	Calculated Load (CFU/sec=(E8*28.32*B8*10))
G8-G20	Coefficient for Determining Die-off Rate (Treta Tech, 1975)
H8-H20	Bacteria Level After Die-Off
I8-20, I25-I33	Bacteria Load After Die-Off
J8-J36	% Contribution at Next Stations (I8/I36)
K8-K20	Projected Percent (%) Load Reduction for Drains (0 for accuracy of spreadsheet with no reduction goals)
L8-L20	Projected Load Reductions in Drains (CFU/sec)
M8-M20	Projected Level Individual Drains (CFU/100ml) number will change as % reduction changes depending on input to cells K8-K20

E41	Fecal Coliform Bacteria Geometric Mean for August 1996 @ next Station
F41	Calculated Load (CFU/sec=(E41*28.32*B41*10))
G41	Calculated Level (CFU/100ml=(I36/B41/28.32/10))
H42	% Difference from Projected Levels and Actual Monitored Levels
K42	River Target Level (number changes as % reduction (J8-J20) change)
H44	% Reduction Levels at LPR-008

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Table 2.												
2	Bacteria Load Calculations												
3	Station LPR-003 to LPR-005						WITH REDUCTIONS						
4	Letha Bridge to Blacks Bridge												
5	Station	Flow	Miles to	time traveled	Existing	Load	Coefficient	Remaining	Load After	%	Reduction	Load	Target
6		cfs	next Station	next station	Count			after die-off	Die Off	Contribution	Goals	Reduction	Level
7				hours	CFU/100ml	CFU/sec		CFU/100ml	CFU/sec	after die-off	%	CFU/sec	CFU/100ml
8													
9	LPR-003	949	12.2	6.0	50	1.34E+07	0.02	44	1.19E+07	33%		1.19E+07	50
10													
11	Returns												
12	Silverleaf	20	10	4.9	1375	7.79E+06	0.02	1247	7.06E+06	19%	80%	1.41E+06	249
13	7 Mile Slough	43	10	4.9	310	3.78E+06	0.02	281	3.42E+06	9%	80%	6.85E+05	56
14	Countyline	26	8	3.9	663	4.88E+06	0.02	613	4.51E+06	12%	80%	9.03E+05	123
15	S-1	50	6	2.9	530	7.50E+06	0.02	500	7.08E+06	19%	80%	1.42E+06	100
16	S-2	27	5	2.4	371	2.84E+06	0.02	353	2.70E+06	7%	75%	6.75E+05	88
17	S-3	13	5	2.4	915	3.37E+06	0.02	871	3.21E+06	9%	80%	6.42E+05	174
18	S-4	32	2	1.0	160	1.45E+06	0.02	157	1.42E+06	4%	75%	3.55E+05	39
19	Sand Hollow	4	10	4.9	378	4.28E+05	0.02	343	3.88E+05	1%	75%	9.71E+04	86
20						0.00E+00	0.02		0.00E+00			0.00E+00	
21						0.00E+00	0.02		0.00E+00			0.00E+00	
22						0.00E+00	0.02		0.00E+00			0.00E+00	
23						0.00E+00	0.02		0.00E+00			0.00E+00	
24													
25													
26	Sub-Total					4.55E+07			4.17E+07	114%		1.81E+07	
27													
28	Withdraws												
29	Accord Ditches	21			50	-2.97E+05			-2.97E+05	-1%		-2.97E+05	
30	ower Payette Ditc	256			50	-3.62E+06			-3.62E+06	-10%		-3.62E+06	
31	Eagle Ditch	30			50	-4.25E+05			-4.25E+05	-1%		-4.25E+05	
32	J/C Ditch	42			50	-5.95E+05			-5.95E+05	-2%		-5.95E+05	
33	Fesbit/MaCFar	12			50	-1.70E+05			-1.70E+05	0%		-1.70E+05	
34						0.00E+00			0.00E+00			0.00E+00	
35						0.00E+00			0.00E+00			0.00E+00	
36						0.00E+00			0.00E+00			0.00E+00	
37						0.00E+00			0.00E+00			0.00E+00	
38													
39	Sub-Total					-5.11E+06			-5.11E+06	-14%		-5.11E+06	
40													
41	Total					4.52E+07			3.66E+07	100%		1.30E+07	
42													
43	Station	Flow			Existing	Calculated	Calculated	% Difference			Target		
44		cfs			Count	Load	After Die Off	from Projected			Level		
45					CFU/100ml	CFU/sec	CFU/100ml	to Actual			CFU/100ml		
46	At Station	927			161	4.23E+07	139	-13%			50		
47	LPR-005												
48													
49													

Table 3

Bacteria Load Calculations

Station LPR-002 to LPR-003 NO REDUCTIONS

Below Emmett WWTP to Letha Bridge

Station	Flow cfs	Miles to next Station	time traveled next station hours	Existing Count CFU/100ml	Load CFU/sec	Coefficient	Remaining after die-off CFU/100ml	Load After Die Off CFU/sec	% Contribution after die-off	Reduction Goals %	Load Reduction CFU/sec	Target Level CFU/100ml
LPR-002	1180	4.5	2.2	33	1.10E+07	0.02	32	1.06E+07	56%		1.06E+07	33
Returns												
Tunnel #7	40	2.5	1.2	318	3.60E+06	0.02	310	3.52E+06	19%		3.52E+06	310
Bissel Cr.	17	1	0.5	384	1.85E+06	0.02	380	1.83E+06	10%		1.83E+06	380
Beacon	35	2.5	1.2	657	6.51E+06	0.02	641	6.35E+06	34%		6.35E+06	641
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
Sub-Total					2.30E+07			2.23E+07	118%		2.23E+07	
Withdraws												
7 Mile Slough	367			33	-3.43E+06			-3.43E+06	-18%		-3.43E+06	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
Sub-Total					-3.43E+06			-3.43E+06	-18%		-3.43E+06	
Total					1.96E+07			1.88E+07	100%		1.88E+07	
Station	Flow cfs			Existing Count CFU/100ml	Calculated Load CFU/sec	Calculated After Die Off CFU/100ml	% Difference from Projected to Actual			Target Level CFU/100ml		
At Station LPR-003	949			60	1.61E+07	70	17%			70		

Table 4.
Bacteria Load Calculations
Station LPR-003 to LPR-005
Letha Bridge to Blacks Bridge

NO REDUCTIONS

Station	Flow cfs	Miles to next Station	time traveled next station hours	Existing Count CFU/100ml	Load CFU/sec	Coefficient	Remaining after die-off CFU/100ml	Load After Die Off CFU/sec	% Contribution after die-off	Reduction Goals %	Load Reduction CFU/sec	Target Level CFU/100ml
LPR-003	949	12.2	6.0	60	1.61E+07	0.02	53	1.43E+07	38%		1.43E+07	60
Returns												
Silverleaf	20	10	4.9	1375	7.79E+06	0.02	1247	7.06E+06	19%		7.06E+06	1247
7 Mile Slough	43	10	4.9	310	3.78E+06	0.02	281	3.42E+06	9%		3.42E+06	281
Countyline	26	8	3.9	663	4.88E+06	0.02	613	4.51E+06	12%		4.51E+06	613
S-1	50	6	2.9	530	7.50E+06	0.02	500	7.08E+06	19%		7.08E+06	500
S-2	27	5	2.4	371	2.84E+06	0.02	353	2.70E+06	7%		2.70E+06	353
S-3	13	5	2.4	915	3.37E+06	0.02	871	3.21E+06	8%		3.21E+06	871
S-4	32	2	1.0	160	1.45E+06	0.02	157	1.42E+06	4%		1.42E+06	157
Sand Hollow	4	10	4.9	378	4.28E+05	0.02	343	3.88E+05	1%		3.88E+05	343
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
Sub-Total					4.82E+07			4.41E+07	116%		4.41E+07	
Withdraws												
Accord Ditches	21			60	-3.57E+05			-3.57E+05	-1%		-3.57E+05	
ower Payette Ditc	256			60	-4.35E+06			-4.35E+06	-11%		-4.35E+06	
Eagle Ditch	30			60	-5.10E+05			-5.10E+05	-1%		-5.10E+05	
J/C Ditch	42			60	-7.14E+05			-7.14E+05	-2%		-7.14E+05	
Fesbit/MaCFar	12			50	-1.70E+05			-1.70E+05	0%		-1.70E+05	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
Sub-Total					-6.10E+06			-6.10E+06	-16%		-6.10E+06	
Total					4.78E+07			3.80E+07	100%		3.80E+07	
Station	Flow			Existing	Calculated	Calculated	% Difference			Target		
	cfs			Count	Load	After Die Off	from Projected			Level		
				CFU/100ml	CFU/sec	CFU/100ml	to Actual			CFU/100ml		
At Station LPR-005	927			161	4.23E+07	145	-10%			145		

Table 5.
Bacteria Load Calculations
Station LPR-005 to LPR-007 NO REDUCTIONS
Blacks Bridge to Highway 95 Bridge

Station	Flow cfs	Miles to next Station	time traveled next station hours	Existing Count CFU/100ml	Load CFU/sec	Coefficient	Remaining after die-off CFU/100ml	Load After Die Off CFU/sec	% Contribution after die-off	Reduction Goals %	Load Reduction CFU/sec	Target Level CFU/100ml
LPR-005	927	8.7	4.3	161	4.23E+07	0.02	148	3.88E+07	35%		3.88E+07	161
Returns												
S-5	64	8.5	4.2	454	8.23E+06	0.02	418	7.57E+06	7%	0%	7.57E+06	418
S-6	22	8	3.9	220	1.37E+06	0.02	203	1.27E+06	1%	0%	1.27E+06	203
S-7	7	7	3.4	40	7.93E+04	0.02	37	7.41E+04	0%	0%	7.41E+04	37
S-8	21	7	3.4	350	2.08E+06	0.02	327	1.94E+06	2%	0%	1.94E+06	327
S-9	7	6.5	3.2	200	3.96E+05	0.02	188	3.72E+05	0%	0%	3.72E+05	188
S-10	25	6	2.9	530	3.75E+06	0.02	500	3.54E+06	3%	0%	3.54E+06	500
S-11	7	5.5	2.7	2300	4.56E+06	0.02	2180	4.32E+06	4%	0%	4.32E+06	2180
S-12	8	5	2.4	947	2.15E+06	0.02	902	2.04E+06	2%	0%	2.04E+06	902
S-13	45	5	2.4	1231	1.57E+07	0.02	1172	1.49E+07	13%	0%	1.49E+07	1172
S-14	17	5	2.4	1200	5.78E+06	0.02	1143	5.50E+06	5%	0%	5.50E+06	1143
S-15	30	3	1.5	1317	1.12E+07	0.02	1279	1.09E+07	10%	0%	1.09E+07	1279
Willow Cr.	160	5	2.4	539	2.44E+07	0.02	513	2.33E+07	21%	0%	2.33E+07	513
Sub-Total					1.22E+08			1.15E+08	103%		1.15E+08	
Withdraws												
Simplots Pumps	50			161	-2.28E+06			-2.28E+06	-2%		-2.28E+06	
Washoe Ditch	20			161	-9.12E+05			-9.12E+05	-1%		-9.12E+05	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
Sub-Total					-3.19E+06			-3.19E+06	-3%		-3.19E+06	
Total					1.20E+08			1.11E+08	100%		1.11E+08	
Station	Flow			Existing	Calculated	Calculated	% Difference			Target		
	cfs			Count	Load	After Die Off	from Projected			Level		
				CFU/100ml	CFU/sec	CFU/100ml	to Actual			CFU/100ml		
At Station LPR-007	1288			294	1.07E+08	305	4%			305		

Table 6.
Bacteria Load Calculations
Station LPR-007 to LPR-008 NO REDUCTIONS
Highway 95 Bridge to Below Payette WWTP

Station	Flow cfs	Miles to next Station	time traveled next station hours	Existing Count CFU/100ml	Load CFU/sec	Coefficient	Remaining after die-off CFU/100ml	Load After Die Off CFU/sec	% Contribution after die-off	Reduction Goals %	Load Reduction CFU/sec	Target Level CFU/100ml
LPR-007	1288	4.5	2.2	294	1.07E+08	0.02	281	1.03E+08	86%		1.03E+08	294
Returns												
49er Slough	45	2	1.0	1288	1.64E+07	0.02	1263	1.61E+07	14%	0%	1.61E+07	1263
Fruitland WWTP	0.2	3	1.5	21	1.19E+03	0.02	20	1.16E+03	0%	0%	1.16E+03	20
Payette WWTP	2.6	0.5	0.2	17	1.25E+04	0.02	17	1.25E+04	0%	0%	1.25E+04	17
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
Sub-Total					1.24E+08			1.19E+08	100%		1.19E+08	
Withdraws												
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
Sub-Total					0.00E+00			0.00E+00	0%		0.00E+00	
Total					1.24E+08			1.19E+08	100%		1.19E+08	
Station	Flow			Existing	Calculated	Calculated	% Difference			Target		
	cfs			Count	Load	After Die Off	from Projected			Level		
				CFU/100ml	CFU/sec	CFU/100ml	to Actual			CFU/100ml		
At Station LPR-008	1380			318	1.24E+08	304	-4%			304		
Overal Reduction, Payette River@ Snake River							-4%					

Table 7
Bacteria Load Calculations
Station LPR-002 to LPR-003 WITH REDUCTIONS
Below Emmett WWTP to Letha Bridge

Station	Flow cfs	Miles to next Station	time traveled next station hours	Existing Count CFU/100ml	Load CFU/sec	Coefficient	Remaining after die-off CFU/100ml	Load After Die Off CFU/sec	% Contribution after die-off	Reduction Goals %	Load Reduction CFU/sec	Target Level CFU/100ml
LPR-002	1180	4.5	2.2	33	1.10E+07	0.02	32	1.06E+07	56%		1.06E+07	33
Returns												
Tunnel #7	40	2.5	1.2	318	3.60E+06	0.02	310	3.52E+06	19%	45%	1.93E+06	171
Bissel Cr.	17	1	0.5	384	1.85E+06	0.02	380	1.83E+06	10%	45%	1.01E+06	209
Beacon	35	2.5	1.2	657	6.51E+06	0.02	641	6.35E+06	34%	45%	3.50E+06	353
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
Sub-Total					2.30E+07			2.23E+07	118%		1.70E+07	
Withdraws												
7 Mile Slough	367			33	-3.43E+06			-3.43E+06	-18%		-3.43E+06	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
Sub-Total					-3.43E+06			-3.43E+06	-18%		-3.43E+06	
Total					1.96E+07			1.88E+07	100%		1.36E+07	
Station	Flow cfs			Existing Count CFU/100ml	Calculated Load CFU/sec	Calculated After Die Off CFU/100ml	% Difference from Projected to Actual			Target Level CFU/100ml		
At Station LPR-003	949			60	1.61E+07	70	17%			50		

Table 8.

Bacteria Load Calculations

Station LPR-003 to LPR-005

Letha Bridge to Blacks Bridge

WITH REDUCTIONS

Station	Flow cfs	Miles to next Station	time traveled next station hours	Existing Count CFU/100ml	Load CFU/sec	Coefficient	Remaining after die-off CFU/100ml	Load After Die Off CFU/sec	% Contribution after die-off	Reduction Goals %	Load Reduction CFU/sec	Target Level CFU/100ml
LPR-003	949	12.2	6.0	50	1.34E+07	0.02	44	1.19E+07	33%		1.19E+07	50
Returns												
Silverleaf	20	10	4.9	1375	7.79E+06	0.02	1247	7.06E+06	19%	80%	1.41E+06	249
7 Mile Slough	43	10	4.9	310	3.78E+06	0.02	281	3.42E+06	9%	80%	6.85E+05	56
Countyline	26	8	3.9	663	4.88E+06	0.02	613	4.51E+06	12%	80%	9.03E+05	123
S-1	50	6	2.9	530	7.50E+06	0.02	500	7.08E+06	19%	80%	1.42E+06	100
S-2	27	5	2.4	371	2.84E+06	0.02	353	2.70E+06	7%	75%	6.75E+05	88
S-3	13	5	2.4	915	3.37E+06	0.02	871	3.21E+06	9%	80%	6.42E+05	174
S-4	32	2	1.0	160	1.45E+06	0.02	157	1.42E+06	4%	75%	3.55E+05	39
Sand Hollow	4	10	4.9	378	4.28E+05	0.02	343	3.88E+05	1%	75%	9.71E+04	86
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
					0.00E+00	0.02		0.00E+00			0.00E+00	
Sub-Total					4.55E+07			4.17E+07	114%		1.81E+07	
Withdraws												
Accord Ditches	21			50	-2.97E+05			-2.97E+05	-1%		-2.97E+05	
ower Payette Ditc	256			50	-3.62E+06			-3.62E+06	-10%		-3.62E+06	
Eagle Ditch	30			50	-4.25E+05			-4.25E+05	-1%		-4.25E+05	
J/C Ditch	42			50	-5.95E+05			-5.95E+05	-2%		-5.95E+05	
Fesbit/MaCFar	12			50	-1.70E+05			-1.70E+05	0%		-1.70E+05	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
Sub-Total					-5.11E+06			-5.11E+06	-14%		-5.11E+06	
Total					4.52E+07			3.66E+07	100%		1.30E+07	
Station	Flow			Existing	Calculated	Calculated	% Difference			Target		
	cfs			Count	Load	After Die Off	from Projected			Level		
				CFU/100ml	CFU/sec	CFU/100ml	to Actual			CFU/100ml		
At Station LPR-005	927			161	4.23E+07	139	-13%			50		

Table 9.

Bacteria Load Calculations

Station LPR-005 to LPR-007 WITH REDUCTIONS

Blacks Bridge to Highway 95 Bridge

Station	Flow cfs	Miles to next Station	time traveled next station hours	Existing Count CFU/100ml	Load CFU/sec	Coefficient	Remaining after die-off CFU/100ml	Load After Die Off CFU/sec	% Contribution after die-off	Reduction Goals %	Load Reduction CFU/sec	Target Level CFU/100ml
LPR-005	927	8.7	4.3	50	1.31E+07	0.02	46	1.21E+07	14%		1.21E+07	50
Returns												
S-5	64	8.5	4.2	454	8.23E+06	0.02	418	7.57E+06	9%	90%	7.57E+05	42
S-6	22	8	3.9	220	1.37E+06	0.02	203	1.27E+06	1%	90%	1.27E+05	20
S-7	7	7	3.4	40	7.93E+04	0.02	37	7.41E+04	0%	90%	7.41E+03	4
S-8	21	7	3.4	350	2.08E+06	0.02	327	1.94E+06	2%	90%	1.94E+05	33
S-9	7	6.5	3.2	200	3.96E+05	0.02	188	3.72E+05	0%	90%	3.72E+04	19
S-10	25	6	2.9	530	3.75E+06	0.02	500	3.54E+06	4%	90%	3.54E+05	50
S-11	7	5.5	2.7	2300	4.56E+06	0.02	2180	4.32E+06	5%	90%	4.32E+05	218
S-12	8	5	2.4	947	2.15E+06	0.02	902	2.04E+06	2%	90%	2.04E+05	90
S-13	45	5	2.4	1231	1.57E+07	0.02	1172	1.49E+07	17%	90%	1.49E+06	117
S-14	17	5	2.4	1200	5.78E+06	0.02	1143	5.50E+06	6%	90%	5.50E+05	114
S-15	30	3	1.5	1317	1.12E+07	0.02	1279	1.09E+07	13%	90%	1.09E+06	128
Willow Cr.	160	5	2.4	539	2.44E+07	0.02	513	2.33E+07	27%	92%	1.86E+06	41
Sub-Total					9.28E+07			8.78E+07	101%		1.92E+07	
Withdraws												
Simplots Pumps	50			50	-7.08E+05			-7.08E+05	-1%		-7.08E+05	
Washoe Ditch	20			50	-2.83E+05			-2.83E+05	0%		-2.83E+05	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
Sub-Total					-9.91E+05			-9.91E+05	-1%		-9.91E+05	
Total					9.21E+07			8.68E+07	100%		1.82E+07	
Station	Flow			Existing	Calculated	Calculated	% Difference			Target		
	cfs			Count	Load	After Die Off	from Projected			Level		
				CFU/100ml	CFU/sec	CFU/100ml	to Actual			CFU/100ml		
At Station LPR-007	1288			294	1.07E+08	238	-19%			50		

Table 10.

Bacteria Load Calculations

Station LPR-007 to LPR-008 WITH REDUCTIONS

Highway 95 Bridge to Below Payette WWTP

Station	Flow cfs	Miles to next Station	time traveled next station hours	Existing Count CFU/100ml	Load CFU/sec	Coefficient	Remaining after die-off CFU/100ml	Load After Die Off CFU/sec	% Contribution after die-off	Reduction Goals %	Load Reduction CFU/sec	Target Level CFU/100ml
LPR-007	1288	4.5	2.2	50	1.82E+07	0.02	48	1.75E+07	52%		1.75E+07	50
Returns												
49er Slough	45	2	1.0	1288	1.64E+07	0.02	1263	1.61E+07	48%	88%	1.93E+06	152
Fruitland WWTP	0.2	3	1.5	21	1.19E+03	0.02	20	1.16E+03	0%	0%	1.16E+03	20
Payette WWTP	2.6	0.5	0.2	17	1.25E+04	0.02	17	1.25E+04	0%	0%	1.25E+04	17
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
					0.00E+00	0.02	0	0.00E+00	0%		0.00E+00	
Sub-Total					3.47E+07			3.36E+07	100%		1.94E+07	
Withdraws												
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00	0%		0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
					0.00E+00			0.00E+00			0.00E+00	
Sub-Total					0.00E+00			0.00E+00	0%		0.00E+00	
Total					3.47E+07			3.36E+07	100%		1.94E+07	
Station	Flow cfs			Existing Count CFU/100ml	Calculated Load CFU/sec	Calculated After Die Off CFU/100ml	% Difference from Projected to Actual			Target Level CFU/100ml		
At Station LPR-008	1380			318	1.24E+08	86	-73%			50		
Overal Reduction, Payette River@ Snake River							-84%					

Table 11.
Bacteria Load Reductions Calculations With Reductions @ 115 /100ml
LPR-005 to LPR-007

Station	Flow	Miles to Next Station	Time next	Existing Count	Load	Die Off Coefficant	Remaining After Die Off	Load After Die Off	% After Die Off	Allocation	Load Reduction	Target
	cfs	Miles to	hours	CFU/100ml	CFU/sec		CFU/100ml	CFU/sec	%	CFU/sec	%	CFU/100ml
LPR-005	778	9	4.4	29	6..39E+06	0.02	27	5.85E+06	64.2%	5.85E+06	0.0%	27
INFLOWS												
S-5	64	8.5	4.2	95	1.72E+06	0.02	87	1.58E+06	9.68%	1.58E+06	0.0%	87
S-6	22	8	3.9	95	5.92E+08	0.02	88	5.47E+05	3.35%	5.47E+05	0.0%	88
S-7	7	7	3.4	95	1.88E+05	0.02	89	1.76E+05	1.07%	1.76E+05	0.0%	89
S-8	21	7	3.4	95	5.65E+05	0.02	89	5.28E+05	0.23%	5.28E+05	0.0%	89
S-9	7	6.5	3.2	95	1.88E+05	0.02	89	1.77E+05	0.07%	1.77E+05	0.0%	89
S-10	25	6	2.9	95	6.73E+05	0.02	90	6.34E+05	0.23%	6.34E+05	0.0%	90
S-11	7	5.5	2.7	95	1.88E+05	0.02	90	1.78E+05	0.06%	1.78E+05	0.0%	90
S-12	8	5	2.4	95	2.15E+05	0.02	90	2.05E+05	0.06%	2.05E+05	0.0%	90
S-13	45	5	2.4	95	1.21E+06	0.02	90	1.55E+06	0.35%	1.15E+06	0.0%	90
S-14	17	5	2.4	95	4.57E+05	0.02	90	4.36E+05	0.13%	4.36E+05	0.0%	90
S-15	30	3	1.5	95	8.07E+05	0.02	92	7.84E+05	0.14%	7.84E+05	0.0%	92
Willow Cr.	160	5	2.4	95	4.30E+06	0.02	90	4.10E+06	1.26%	4.10E+06	0.0%	90
New Plymouth	0.17	8	3.9	200	9.63E+03	0.02	185	8.90E+03	0.00%	8.90E+03	0.0%	185
									0.00%			
Sub-Total					1.11E+07			1.05E+07	3.73%	1.05E+07		
									0.00%			
Sub Total												
Inflows			0.0		1.75E+07	0.02		1.64E+07	84.6%	1.64E+07		74
WITHDRAWLS												
Simplots	50	0	0.0	29	4.11E+05	0.02	29	4.11E+05	0.77%	6.51E+05		29
Washoe	20	0	0.0	29	1.64E+05	0.02	29	1.64E+05	0.29%	2.61E+05		29
			0.0	29	0.00E+00	0.02	29	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
Sub-Total					5.75E+05			5.75E+05		5.75E+05		
Sub Totals												
Out Flows			0.0		5.75E+05	0.02	0	5.75E+05	3.4%	5.75E+05		#DIV/0!
Totals					**1.69E+07**			**1.58E+07**	**81.17%**	**1.58E+07**		**48.812**

Station	Flow	Existing Count	Calculated Load		Calculated After Die Off	% Difference from Projected to Actual	Calculated Load After Reductions	Calculated after Reductions	Target Load	Target Level
		CFU/100ml	CFU/sec		CFU /100ml		CFU /00ml	CFU/100ml	CFU/sec	CFU 100/ml
LPR-007	1142	294	9.51E+07		1.58E+07	602%	49	1.58E+07	1.62E+07	50

Table 12.
Bacteria Load Reductions Calculations — With Reductions @ 115/ 100ml
LPR-007 to LPR-008

Station	Flow cfs	Miles to Next Station Miles to	Time Traved next Station hours	Existing Count CFU/100ml	Load CFU/sec	Die Off Coefficant	Remaining After Die Off CFU/100ml	Load After Die Off CFU/sec	% Contribution After Die Off %	Allocation CFU/sec	Load Reduction %	Target CFU/100ml
LPR-007	1142	3.5	1.7	47	1.52E+07	0.02	45	1.47E+07	7.7%	1.47E+07		45
INFLOWS												
49 er Slough	45	2	1.0	95	1.21E+06	0.02	93	1.19E+06	7.46%	1.19E+06		93
Fruitland WWTP	0.07	3	1.5	200	3.96E+03	0.02	194	3.85E+03	0.02%	3.85E+03		194
Payette WWTP	0.56	0.5	0.2	200	3.17E+04	0.02	199	3.16E+04	0.20%	3.16E+04		199
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
Sub-Total					1.25E+06			1.22E+06		1.22E+06		
Sub Total Inflows					1.64E+07			1.59E+07	15.4%	1.59E+07		49
WITHDRAWLS												
		0	0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
		0	0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
			0.0		0.00E+00	0.02	0	0.00E+00	0.00%	0.00E+00		#DIV/0!
Sub-Total					0.00E+00			0.00E+00		0.00E+00		
Sub Totals Out Flows			0.0		0.00E+00	0.02	0	0.00E+00	0.0%	0.00E+00		#DIV/0!
Totals					**1.64E+07**			**1.59E+07**	**15.37%**	**1.59E+07**		**45.238**

Station		Flow		Existing Count CFU/100ml	Calculated Load CFU/sec		Calculated After Die Off CFU /100ml	% Difference from Projected to Actual	Calculated Level CFU /00ml	Calculated after Reductions CFU/100ml	Target Load CFU/sec	Target Level CFU 100/ml
LPR-008		1242		318	1.12E+08		1.59E+07	-603%	45	1.59E+07	1.76E+07	50

Appendix G. Comments to Previous Draft Documents

From: Randy Phelan, NRCS, March 15, 1999

Page 3: Pollutants of Concern, Sediment is not listed. It seems strange that the South Fork Payette River (17050120), the Middle Fork Payette (17050120), Bissel Creek (17050123), Black Canyon Reservoir (17050122-2695) and the Snake River (17050103) are all listed for sediment, but the Lower Payette River below Black Canyon Reservoir to the mouth of the Snake River (17050122-2689) is not listed for sediment and therefore not addressed in this Sub-Basin Assessment.

Response: The 1994 303(d) list did not list sediments as a pollutant of concern. There is no compiling evidence that sediments are impairing beneficial uses in the lower Payette River. Turbidity data collected during the 1997 and 1998, did not indicate suspended sediments were at levels that would impair sight feeding capability of fisheries.

Page 16: 2.1.4. Fisheries, last sentence, "Since most trout species require clean spawning gravels, usually associated with smaller tributaries, trout spawning may not be present in the lower Payette River." This eludes to the fact that sediment is effecting the cold water Boita.

Response: Since no native trout species were documented in 1974 (Reid, 1975). It would be assumed that trout were not utilizing the lower Payette River for spawning at that time. Most trout species do not utilize large river systems for spawning, but use the larger systems for rearing. The lack of access to historic spawning areas, would be classified as habitat modification. Habitat modification is not considered a pollutant to be addressed by TMDLs..

Page 27: 2.3.8 Recreational Use, last sentence, "Historical and present water quality information demonstrates that primary and secondary contact recreation are not fully supported due to the exceedence of bacteria standards and sediment." If this is indeed the case then we should be addressing sediment in the TMDL.

Response: The impairment by sediments to primary and secondary contact recreation was a typo error and has been removed. It was not demonstrated that sediment was impairing primary or secondary contact recreation beneficial uses. Nor, has it ever been noted that sediments were impairing these uses. It is stated in Section 2.8, that sediment and bacteria are somewhat correlated, and that sediment should be addressed as a linkage to bacteria.

Page 33: Transport, the second and third paragraphs monitoring substantiates that suspended sediment is a transport and a problem.

Response: It is recognized that sediment is a link between it and other pollutants of concern, Section 2.8.

Page 34: Current Water Quality Impairment, the third paragraph states that "Based on these results, DEQ has determined that nutrients are not impacting the beneficial uses, namely sediment filling the gravel substrate?

Response: The result of sediments filling pools and covering gravels is more associated with river channel alterations and flow modifications. It was never demonstrated that sediments were directly impairing beneficial uses.

Page 34: Temperature, I believe it would be helpful to farmers to have the Fahrenheit degrees listed with the Celsius temperatures.

Response: A temperature conversion from centigrade to Fahrenheit is incorporated in the Glossary Terms and Acronyms.

Page 35: Temperature, Transport, Does the monitoring data show that sediment may be an external input to the increase in temperature?

Response: There was no monitoring completed to demonstrated that sediment and temperature are correlated. However, at monitoring Station LPR-001 where suspended sediment levels are low, water temperature still exceeded state water quality standards.

Page 37: 2.6.3 Bacteria, Transport, second to last paragraph, This is reason to have sediment as part of the TMDL.

Response: The 1994 303(d) list did not list sediments as a pollution of concern. It is demonstrated that there is a correlation between bacteria and sediment. The development of the implementation plan and watershed management plan will need to address sediment as a link between both nutrients and bacteria.

Page 39: 2.8 Carriers/Linkage, 2.8.1. Sediment, first paragraph, Mike makes a good argument, why sediment should be targeted for the TMDL and why a sediment reduction must be included in the TMDL.

Response: The 1994 303(d) list did not list sediments as a pollution of concern, but a link to be associated with other pollutants.

Page 40: 2.9.2 Flow Modification, When will the salmon flow augmentation assessment be completed and if positive, can we continue the process for water quality?

Response: It was not within the scope of this SBA-TMDL to determine what were the impacts from the flow augmentation in the lower Payette River. If water quality degrades after the flow augmentation is complete, the data will be available to determine what the overall impacts to water quality were.

Appendix A: graphs, add foot noted and list the state water quality standard. List the name of station under the number.

Response: Graphs will be modified if resources are available.

Appendix A, Flow Data: Mike, you stated that you used flow data after August of 1996. Does that data include the flow data for 1997-1998? If not, how would the pollutant loads equate of you used the 1997-1998 data where the measured flow more closely follows the historical flow data?

Response: August 1996 flow data was used for bacteria loading only. August 1996 showed the highest bacteria levels for the six months of monitoring for bacteria. It is appropriate that 1996 flow data be used for bacteria loading analysis. If further development of a watershed management plan is to occur, then flow data for 1997-1998 should be utilized for that plan.

I believe that we need to address sediment in the Lower Payette TMDL.

Response: The 1994 303(d) list did not list sediments as a pollution of concern. There is no compiling evidence that sediments are impairing beneficial uses in the lower Payette River. Turbidity data collected during the 1997 and 1998, did not indicate suspended sediments were at levels that would impair sight feeding capability of fisheries.

Ron Brooks, Idaho Soil Conservation Commission, March 16, 1999

I have completed my review of the Lower Payette River Sub-Basin Assessment distributed February 18, 1999 at the Watershed Advisory Group meeting. Upon review of this document, my primary concern was the use and interpretation of the data collected for nutrient concentrations in the Lower Payette River.

Response: No response warranted.

I believe there needs to be more discussion in the text about the nutrient concentrations measured in 1996, 1997, 1998. At present, these data are neither discussed in the text nor referenced as being in the Appendix. After reviewing, these data it is my opinion that the measured nutrient concentrations provide stronger evidence that nutrients are impacting beneficial uses.

Response: The State of Idaho utilizes a narrative criteria for nutrients. It was not demonstrated that nutrients were impairing beneficial uses with the data collected in 1997-1998. It was stated in the Executive Summary that nutrients were at levels that may cause impairment of beneficial uses. And, it is recommended that a watershed management plan be developed for the lower Payette River to address nutrients.

On page 33 you state, "... nutrient concentrations are at levels that may cause nuisance aquatic growth." You also provide EPA's recommended criteria for total Phosphorus and Nitrates, concentrations that if exceeded, may cause excessive or nuisance aquatic growth. According to the data in the Appendix, 61 samples from LPR-001 to LPR-008 contained Phosphorus concentrations occasions, the nitrates criteria of 0.3 mg/L was exceeded, the majority of which occurred from LPR-007 to LPR-008.

Response: The EPA recommendations are recommendations which are not included in the state water quality standards. Since it was not demonstrated that nutrients were impairing beneficial uses, the State of Idaho Water Quality Standards were not exceeded.

I believe it is safe to assume that if there is nuisance aquatic growth, then there would be also be impairment of beneficial uses; at a minimum an impairment of primary and secondary contact recreation. I also believe that these data provide strong evidence that the nutrient concentrations measured from 1996-1998 were at levels that may cause nuisance aquatic growth, at least in portions of the river. Unfortunately, this growth could not occur and impairment of beneficial uses could not be shown due to the record flow conditions during much of the sampling period. However, under normal conditions I think that impairment of beneficial uses caused by excessive nutrients would be quite easy to document on the Lower Payette River.

Response: It is speculated that nuisance aquatic vegetation growth may occur at lower historical flows. However, there has never been any demonstration that aquatic vegetation has ever impaired beneficial uses.

I hope these comments are useful. I realize that nutrients will have to be addressed under a load allocation once the Brownlee TMDL is finished. However, I think we can be further along in the meeting the Brownlee allocation

if we include a load allocation now for nutrients in the Lower Payette TMDL. If you have any questions call me at 642-4402 ext. 111.

Response: Thank you for your comments. The Snake-Brownlee TMDL will be completed by 2001. Reduction targets for nutrients may have to be addresseded at that time for the lower Payette River.

Michael A Raymond, NRCS, March 12, 1999

I have the following comments regarding the Lower Payette River Sub-Basin Assessment:
The Appendix to the report contains a great deal of data collected over the last three years. However, the text does little to summarize or explain the significance of these data. There are also numerous references made to historical data in the text, but little of is included for review. Perhaps these data should also be included in the report, especially those pertaining to past main-stem river monitoring. It would also be very valuable to have each parameter compared to appropriate water quality standards.

Response: Any data that was comparable to numeric water quality standards was (temperature and bacteria). Most of the historical data was examined to show why the lower Payette River was listed on the 303(d) list. The purpose of the SBA is to determine the extent of impairment to the beneficial uses.

The assessment indicates that no complaints have been received concerning the aesthetics of the river. However, the Lower Payette River Water Quality Planning Project Final Report (Payette SWCD, 1993) contains information to the contrary (see, Aesthetics, page 92). If there is a more formal process required for notifying DEQ of a concern with the river's aesthetics, please let me know.

Response: The lower Payette River is protected for Aesthetics, however there are no numeric standards to judge aesthetics. And, the State DEQ has no recorded complaints on aesthetics quality in the lower Payette River.

The text states on page 32 under "Nutrients-History" that the highest total P concentrations measured for the river was 0.35 mg/l. The data in the appendix shows a monitored level of 0.4 mg/l in 1998.

Response: This value is left in the tables to show overall water quality of the lower Payette River. Statisically, this value would be considered to be an outlier, but was left to show high nutrients that can be found in the lower Payette River. If the data in Appendix B is to be utilized in the development of a watershed management plan, this value would be removed from overall analysis.

On page 37 in the discussion of bacteria transport, the assessment states that there is a general relationship between fecal coliform and sediments. This implies a correlation between these variables was made. Similar implied correlations are made at several points in the report. If correlations were run, I suggest that the appropriate statistics be provided to support these statements. If correlations were not made, maybe they would be helpful for interpretation of the data.

Response: Correlation values can be found in referenced material Lower Payette River Agriculture Irrigation Water Return and Ground Water Evaluation (Ingham, 1996)

For some time, I have been concerned about the exclusion of nutrients and sediment from the proposed TMDL. I have not made this an issue for a couples pf reasons. First, I don't feel it is my position to try and direct what

might become a regulatory process. Second, my opposition to excluding these pollutants from a TMDL might be interpreted by some as being unsupportive of agricultural interests, which is definitely not the case. However, I am charged to work in cooperation with the Payette SWCD to try and protect and improve the condition of natural resources in Payette county. I have discussed this situation with the direct board members on several occasions, and offer my remaining comments with the condition of the district's natural resources in mind.

Response: Concerns noted

The assertion that DEQ has determined that aquatic vegetation is not impacting beneficial uses in the river (page-34 - Current Water Quality Impairment) is not well supported by other information contained in the text or the monitoring data included in the appendix. The text describes the river as slow moving, wide and shallow with little shading and high potential to allow photosynthesis to occur in aquatic plants. Data contained in the appendix shows that nutrients increase considerably as the river flows down the valley, and that exceedence of the EPA recommended criteria for total phosphorus and nitrite-nitrate as nitrogen is found with increasing frequency as this occurs. Exceedence of EPA recommended criteria for P increases from 6 to 60 percent of samples for data collected at the Black Canyon Dam and below the Payette WWTP, respectively. A similar comparison for NO_2-NO_3 shows and increase in exceedence from zero to 41 percent of the samples taken. For total P, the average of all samples taken below the Payette WWTP (0.125 mg/l) exceeds the EPA recommended criteria, while the average for NO_2-NO_3 at the same location (0.3 mg/l) matches the criteria for that pollutant. Single measurements show that total P at four times and NO_2-NO_3 at more than three times the EPA criteria.

Response: The EPA recommendations are recommendationswhich are not included in the state water quality standards.. Since it was not demonstrated that nutrients were impairing beneficial uses, the State of Idaho Water Quality Standards were not exceeded.

Consideration of these facts, coupled with your observation that above normal flows may have impacted the ability for aquatic vegetation to become established during the limited DO and chlorophyll *a* monitoring conducted, lend little credibility to the determination that nutrients are not impacting beneficial uses. River flows have not only been above normal during the course of this monitoring, they have been at record levels. Also, previous studies mentioned in the report seem to support the concept that nutrients are impacting beneficial uses.

Response: It is speculated that nuisance aquatic vegetation growth may occur at lower historical flows. However, there has never been any demonstration that aquatic vegetation has ever impaired beneficial uses.

Recently, I reviewed a report published by USGS in cooperation with Idaho DEQ entitled *Water-Quality Conditions of the Lower Boise River, Ada and Canyon Counties, Idaho, May 1994 Through February 1997* (Mullins, William H., Water Resources Investigations Report 98-4111, 1998). This report (see attached copy) includes data concerning nutrient and sediment loading in the Boise River, based on recently completed monitoring. Calculation of pollutant loads can also be made for the Lower Payette River using the data provided in the appendix of the sub-basin assessment (see attached spreadsheet). Comparison of the average total P load in the Payette River below the Payette WWTP to the median total P load measures in the Boise River near Parma shows that the Payette River is carrying more than half again as much total P as the Boise River. A similar comparison for total N (TKN plus NO_2-NO_3) shows the Payette is carrying about 90% of the N load carried by the Boise. Comparison of sediment loads shows the Payette to be carrying 610 tons/day while the Boise River carries 299 tons/day - less than half of the sediment load carried by the Payette. It is my understanding that the TMDL developed for the Lower Boise River includes both nutrient and sediment components. In light of these observations and considering the likelihood that reduction of loading of these pollutants will be a required component of any TMDL developed on the Snake River, I recommend that they should also be considered as components of the TMDL for the Lower Payette River.

Response: The TMDL developed for the lower Boise River did not include an allocation for nutrients, but will be deferred until completion of the TMDL for Brownlee Reservoir. It was not demonstrated that nutrients or sediments are impairing beneficial uses, or exceeding State of Idaho Water Quality Standards.

Gem Soil and Water Conservation District, April 6, 1999

The Gem Soil & Water Conservation District would like to comment on the Lower Payette River Sub-Basin Assessment submitted by the Idaho Division of Environmental Quality. The supervisors know that the river is vital to the area and would like to continue to maintain and improve the quality of the water as it goes through our district. We will continue to encourage the use of Best Management Practices on farms, ranches, and urban areas to keep pollutants from reaching the river.

The Sub-Basin Assessment states that the Lower Payette River is presently meeting state standards for nutrients and sediment, and that they are not pollutants of concern for any beneficial uses (page 25 table 4). The existence of nuisance aquatic growth is the state standard for listing nutrients as pollutants of concern. Monitoring data in the assessment does not indicate Dissolved Oxygen depletion below the state water quality standard to support algae growth. (Page 32, 2.6.1, Historical Data, third paragraph). Therefore, the District supports the Assessment as it is written and does not support the addition of nutrients and sediment to the TMDL.

Response: Comments noted

The District recognizes that there is a potential problem with the level of phosphorus entering the Snake River from the Payette River. Although it meets state standards at this time, we should work to reduce the level in the future. We work voluntarily with the farmers in our area to apply BMP's and will continue to educate all residents to produce phosphorus in the river.

Response: It is recommended that a watershed management plan be developed to address nutrients and sediments.

Continued monitoring on the river is imperative. We support the Assessment conclusion that "during the implementation phase of TMDL, an in-depth monitoring plan will have to be developed to determine the effectiveness of the TMDL on the Lower Payette River." If nutrients and sediment are added to the TMDL as pollutants of concern, the Gem SWCD would like the improvements made from the present to the time of the TMDL documented so that they will be recognized by the courts, DEQ, EPA, or whoever makes the assessment, as progress achieved by the users of the river and the agricultural community.

Response: A TMDL effectiveness monitoring plan will be developed and incorporated into the implementation plan. If a watershed management plan is developed for sediments and nutrients, a monitoring plan should also be developed.

The Gem SWCD recognizes the level of bacteria as a concern on the river. The Assessment states that there were some violations that exceeded the primary contact and secondary contact recreation levels. (Page 36) Bacteria can come from various sources. Therefore, the board would like to see additional testing done to establish the source so the problem can be solved.

Response: With both the 1996, 1997 and 1999 in-river bacteria evaluations, along with IDA 's drain monitoring, sufficient data will be available to determine bacteria source and transportation in the area. In conclusion, the Gem SWCD supports the final draft of the Lower Payette River Sub-Basin Assessment as it is written and submitted in February 1999.

Randy Phelan- April 7, 1999

I believe that the Lower Payette River Sub-basin Assessment contains conflicting data and DEQ's determination that nutrients are not impacting the beneficial uses (page 34) is inconclusive because the pheriphyton samples have not been evaluated (page 34).

Response: Although pheriphyton analysis was not completed, enough information was collected to determine that nutrients were not impairing beneficial uses. There are no established State of Idaho protocols that would be able to demonstrate beneficial use support utilizing pheriphyton data.

The State of Idaho narrative standard states that "surface waters of the state shall be free from excess nutrients that can cause nuisance aquatic growth impairing designated protected beneficial uses (page 32). This standard is rather subjective. Noxious algae growth may not be present, but the slime growth is present on the rocks of the lower portion of the Payette.

Response: It was never demonstrated that nutrients were impairing beneficial uses, or that State of Idaho Water Quality Standards were exceeded. It is speculated that nuisance aquatic vegetation growth may occur at lower historical flows. However, there has never been any demonstration that aquatic vegetation has ever impaired beneficial uses.

The EPA Quality Criteria for Water recommends that there be less than .1mg/l of phosphorus and less than .3mg/l for nitrates.

Response: It is speculated that nuisance aquatic vegetation growth may occur at lower historical flows. However, there has never been any demonstration that aquatic vegetation has ever impaired beneficial uses.

Appendix A data shows that the 1997 & 1998 overall data inherits .05 mg/l of Total Phosphorus upstream of the Black Canyon Dam and exports .125 mg/l of Total Phosphorus to the Snake River. This is an increase of .075mg/l through the 38.5 mile stretch from the dam to the Snake River. We are exporting .025 mg/l above the EPA Quality Criteria of .1mg/l. Historical data also shows that there have been exceedences of the EPA Criteria (page 32). Myers 1997 data shows the lower Payette River contributing between 15-25% of the total yearly, Total Phosphorus load to the snake River (page 34). With only two samples the 1997 and 1998 Dissolve Oxygen monitoring is inconclusive to determine if supersaturation is occurring (Appendix A, DO graph). Even though there is no recent documentation of DO depletion, nutrient concentrations are at levels that may cause nuisance aquatic growth. Above normal flow may have impacted the ability of aquatic vegetation to become established (page 33).

Response: The Snake-Brownlee TMDL will be completed by 2001. Reduction targets for nutrients may have to be addressed at that time for the lower Payette River.

Studies completed by the Payette SWCD and Mike Ingham in 1992 and 1996 respectively, indicate that total phosphorus was associated with high sediment loads (page 33). Historic and present water quality information demonstrates that primary and secondary contact recreation are not fully supported due to the exceedence of bacteria standards and sediment (page 27, 2.38).

Response: The impairment to primary and secondary contact recreation by sediments was a typo error and

has been removed. There is no indication that sediments are impairing these uses. It is stated in Section 2.8, that sediment and bacteria are somewhat correlated, and that sediment should be addressed as a linkage to bacteria.

Bacteria are easily transported with both organic and inorganic material. Sampling results from the lower Payette River area indicate a general relationship between fecal coliform and suspended sediments. The survivability of bacteria in water is limited and can be affected by a variety of conditions including sunlight, available food, nutrients, and water temperatures (page 37). Since monitoring showed that bacteria was high. Does it not follow that nutrients and sediment may also be a concern?

Response: It is recognized that sediment is a link between it and other pollutants of concern, Section 2.8.

The Sub-Basin Assessment has conflicting data, will a red flag be raised when the Payette River is exporting phosphorus into the Snake River at a level above the EPA criteria?

Response: The Snake-Brownlee TMDL will be completed by 2001. Reduction targets for nutrients may have to be addresseded at that time for the lower Payette River.

From: Mark Limbaugh, Payette Water District #65, January 27, 1999

I appreciate the opportunity to comment on your draft Lower Payette River Sub-Basin Assessment. I noted the following problems or suggestions to the draft document:

Page 8 Para 3: The first sentence mentions "low flows" as an "extreme" condition noted as occurring during the past 10 years on the Lower Payette River. You should mention that these flows, noted as "lowest flow on record" and "seven day-ten year minimum flow" were recorded at the USGS Payette gage, if that is where they were recorded. You should also note the frequency of these flows during the ten-year period referenced.

Response: The adjective "extreme" has been removed. As a reference to the seven day ten year low flow, it will be referenced this was recorded at Payette, Idaho (USGS Gage). It is already referenced these are the "extremes" for the period of record.

Page 8, Para 6: The "Nobel" canal is actually the Noble Canal. Also, you should mention the Enterprise, Bilbrey, and Letha irrigation ditches as other diversions on the south side of the river.

Response: Misspelling of Noble Canal is noted, and will be changed. A reference to the Enterprise and Bilbrey Canals are noted in the mass-balance spreadsheets, but will be added to the schematic. Letah ditch can not be located in the Water master's Report, Payette Water District #65. Many of the Ditches and Canals may originate from the 7 Mile Slough. It is difficult to determine which ditch is Letha Ditch, or if it originates from the Payette River or from the 7 Mile Slough. A map location and a average cfs withdrawal would be helpful in showing this ditches origin. Not all ditches, canals, and pumps are shown (too numerous). The schematic and the mass-balance limited withdrawals to 20 cfs or greater.

Page 21, Para 5:I suggest the following paragraph be used to replace Paragraph 5:

" It is speculated that reduction of water temperature in the Lower Payette River will not greatly influence the maintenance of a viable trout population. Mountain Whitefish appear to be thriving and maintaining a viable, and an assorted age class, population, even though temperature standards for cold water biota are exceeded throughout the system."

Response: As the paragraph reads, the most likely influence of the lack of a viable trout population is due to lack of access to historic spawning areas. This relates to the habitat alteration. This will not influence the development of the TMDL since habitat alteration is not addressed in the State of Idaho Water Quality Standards and is not a pollutant subject to TMDL development. The paragraph referenced will not be changed.

Page 27, Para 1: "2.1.7 Historic Presents of Man" should read "presence" of man.

Response: Noted and changed.

Page 27, Para 5: In the second sentence, the word "were" should be "where".

Response: Noted and changed.

Page 36, Para 5: The third sentence should include the word "hour" after "Twenty four".

Response: Noted and changed.

Page 38, Para 6: I suggest the following paragraph be used to replace Paragraph 6 in its entirety: "Based on these results, DEQ has determined nutrients are not impacting the beneficial used, namely cold water biota, in the Lower Payette River." The reason for this change, in my opinion, is that there is currently no peer-reviewed data to prove that current levels of nutrient loading from the Lower Payette River impact beneficial uses in the Lower Snake River at Brownlee Reservoir. Also, Idaho Power data and modeling efforts have not been peer-reviewed and should not be used anywhere in the Sub-Basin assessment for the Lower Payette River.

Response: Reference to the Lower Snake-Brownlee TMDL will remain. Since this is the only available data to determine impacts to the Snake River and Brownlee, it will be noted. If future monitoring or data evaluation determine there are no impacts to the Lower Snake or Brownlee Reservoir from the lower Payette River it will be indicated in the respecived Sub-Basin Assessments.

Page 40, Para 2: I suggest this paragraph be eliminated, due to the fact that it is irrelevant to the discussion of "Sources" of temperatures in the Lower Payette River. Sources were identified in the first paragraph as "solar radiation input, thermal modification (industrial) and/or geothermal input." Discussion of "possible reasons high temperatures occur in the Lower Payette River" in paragraph 2 is irrelevant in that the authority for temperature input regulation by a TMDL rests within the NPDES permitting system, which does not include the "reasons" in this paragraph.

Response: Since all these referenced increases to the availability of solar radiation, the statement will remain. Irrigation water return does increase the amount of surface area exposed to solar radiation. As water is "spread" across fields for irrigation, increased exposure to solar radiation does occur. #2, and #3 all increase the exposure to solar radiation. The water originating from Black Canyon Dam demonstrates that solar radiation on the reservoir has increased water temperature to the extent that exceedences of State Water Quality Standards for temperature occur before input from areas below the dam.

Page 45, para 3: In the second sentence, "low flows" are mentioned as not allowing sediment to be carried out of basin and is affecting water depths in the river, thus affecting in-river temperatures. As I have stated before, flow modification is not a pollutant, is not regulated by the TMDL as a point source, and the definition of "low flow" is vague in the paragraph. I suggest that "low flows"

be described as a stressor only if there is a definitive flow level for water quality impairment, complete with data to support this assertion, or not listed at all as a stressor if this data is incomplete or nonexistent.

Response: Reference to low flows has been removed.

Page 47: I suggest possibly mentioning effluent trading as an option being studied in assisting point sources with current and future NPDES permit requirements.

Response: Effluent trading will be addressed in the implementation plan, if applicable.

Again, thank you for the opportunity to comment in this Sub-Basin assessment fir the Lower Payette River. I look forward to visiting with you about these comments and continuing to assist DEQ in their efforts to draft a TMDL on the Lower Payette River.

From: Calude Bruce, Payette Soil and Water Conservation District, April 15, 1999

The Board of Supervisors of the Payette Soil and Water Conservation District has reviewed the Lower Payette River Sub-Basin Assessment. We have comments as to the content of the assessment and to it's affect on the drafting of the TMDL document. Most importantly, we have comments on it's eventual influence on the TMDL implementation plan as it relates to the mission and goals of the Payette Soil and Water conservation District.

After careful consideration, the Board has these observations on the Lower Payette River Sub-Basin Assessment document:

The data contained in the report covers a limited time frame and scope. The data are valid for the time period, but generally the time period spanned is too short to reflect a true picture of the river's dynamics.

Response: It is agreed the SBA and TMDL is developed with limited data. But the available data does indicate the present conditions of the lower Payette River. It is agreed the system is dynamic, and conditions can change based on available flows and water use. A review of historical data and current data, indicates contact recreation as the only impaired beneficial use..

The appendix tables show that, compared to EPA recommendations, 60% of the samples taken nearest the mouth of the river were high in phosphorus and 40% were high in nitrogen. Nutrient reduction in the river is an essential part of the goals listed in the Payette SWCD's long-range plans.

Response: The EPA recommendations are recommendations which are not included in the state water quality standards.. Since it was not demonstrated that nutrients were impairing beneficial uses, the State of Idaho Water Quality Standards were not exceeded. It is recommended that a watershed management plan be developed to address nutrients and the associated sediments.

The augmented flows for Salmon recovery may be influencing temperature, dissolved oxygen, and chlorophyll and production data, as well as creating a dilution effect for measured pollutants.

Response: The possible effects of fish flow augmentation are stated in Section 2.6.1.

Sediment reduction is being considered in other comparable river systems and is also part of the goals listed in this district's long-range plans. It was not the scope of this SBA-TMDL to determine what were the impacts from the flow augmentation in the lower Payette River. If water quality degrades after the flow augmentation is complete, the data will be available to determine what the overall impacts to water quality were

Response: The 1994 303(d) list did not list sediments as a pollution of concern. There is no compelling evidence that sediments are impairing beneficial uses in the lower Payette River. Turbidity data collected during the 1997 and 1998, did not indicate suspended sediments were at levels that would impair sight feeding capability of fisheries. Sediment should be addressed in a watershed management plan..

The assessment does not allow for the "no net increase" concept that has been described in the past. To address this concept, the TMDL implementation document should also as least address nutrient and sediment issues.

Response: No Net Increase should be addressed in the watershed management plan.

The Payette Soil and Water Conservation District, for the above reasons and in consideration of our mission to conserve and protect the natural resources of Payette County, has voted to go on record in stating that we feel the Sub-Basin Assessment is incomplete and inconclusive. The Board feels that there are too many unanswered questions involved to exclude nutrients and sediment from the TMDL. Also, the Lower Snake/Brownlee TMDL is very likely to affect the load allocation assigned to the Payette River.

Response: Comments noted. The Snake-Brownlee TMDL will be completed by 2001. Reduction targets for nutrients may have to be addressed at that time for the lower Payette River.

The Payette SWCD Supervisors are unanimous in our opinion that a pro-active approach toward improving water quality must be taken. The goals set by this district dictate that we take this position. All members of the Payette Soil and Water Conservation District Board of Supervisors feel that the uncontroversial approach provided by the assessment document is unwise considering the long-term risks created by failing to address nutrients and sediment. Therefore, we recommend that the appropriate action be taken through the Lower Payette River Watershed Advisory Group to address these issued.

Response: It is recommended that the local Soil Conservation Districts take an active role in developing a watershed management plan and to seek funding to address issues addressed in the watershed management plan.

We would appreciate hearing any comments you might have concerning our interpretation of the information contained in the Sub-Basin Assessment. Thank you for the opportunity to provide our viewpoint.

Response: Thank you for your comments.

Comments Received on Final Draft

Laurie Mann
USEPA - Region 10

Comments 1-6 below must be addressed prior to approval of the Lower Payette River TMDL. Each comment is followed by a "discussion" that gives ideas and recommendations (not requirements) for the way the comment can be addressed.

Bacteria

1. Loading Capacity. A loading capacity needs to be clearly defined for the water body.

   Discussion: It appears that 50/100 ml was used as an in-stream target. Please consider expressing the loading capacity, load allocations, wasteload allocations and margin of safety in equivalent units (e.g. concentration). As written, it is difficult to compare the sum of the allocations (in units of CFU/sec) to a loading capacity in units of CFU/ml (see also comments 8 below.)

Response: All target or loading allocations have been established in CFU/sec

2. Load Allocations. The load allocations need to be clearly defined for the water body.

   Discussion: If the "target loads" in Table 11 represent the load allocations, they should be clearly identified as such.

Response: Target loads in previous documents have been redefined as Loading Allocations.

3. Wasteload Allocations. The wasteload allocations need to be clearly defined for the point sources discharging to the water body. If allocations are not made for the point sources, the allocations for those facilities will be zero.

   Discussion: The wasteload allocation for each of the WWTPs will eventually be incorporated into NPDES permits, and is typically calculated using either water quality standards or performance levels as a basis. The "target levels" for Fruitland and Payette WWTP in Appendix Table 6 appear to be based on performance. It the TMDL is intended to allow a discharge/load from the Emmett and New Plymouth WWTP's, these facilities need to be included in the appropriate spreadsheet calculations in Appendix F and receive a wasteload allocation.

Response: Wasteload allocations have been defined for point sources.

It is recommended that CAFOs be specifically discussed in Section 4.4.2, and that a wasteload allocation of zero be given to all confined feeding operations that meet the federal definition of a CAFO. The list of CAFO's and CFAs in Table 8 will quickly be out of date; therefore, giving a sector wide wasteload allocation of zero will be more meaningful than giving a zero wasteload allocation to those CAFOs/CFAs that are currently known.

Response: CAFOs have been given a zero (0) discharge wasteload allocation.

4. Reasonable Assurance. Approval of this TMDL will be based, in part, upon reasonable assurance that non-point source reductions will occur. Reasonable assurance can be provided by documentation in the TMDL or in separate documents, of the following elements:
   a. Documentation of existing implementation commitments within the watershed, such as currently funded BMP's and other restoration projects, letters of commitment from landowners, local ordinances, etc., and

   b. Commitment is provided to:

      - develop an implementation plan within a specified period of time, and
      - include a monitoring program in the implementation plan which evaluates both 1) implementation of BMPs and other needed control actions, and 2) trends in relevant water quality parameters, and
      - seek funding for the implementation plan, and

   c. The process for revising the TMDL is explained.

Response: DEQ believes that the Reasonable Assurance outlined in this document fulfills the requirements under the Clean Water Act. Further activity as request will be completed under the Implementation Plan.

5. Attainment of Water Quality Criteria. Since no loading capacity was developed, it is difficult to assess whether the attainment of the allocations would lead to the attainment of the water quality criteria. There is no clear link between the criteria, the target loads, percent reductions required, and resultant in-stream criteria. It appears, that this should be present within the Tables of Appendix F, however, these loads and reductions do not seem to be consistent with those displayed in Table 11.

Response: Changes to all Tables have been made. Calculations have been shown that will demonstrate achievement of the State of Idaho Water Quality Standard for Primary and Secondary Contact Recreation.

6. Geometric Mean Criteria. Please explain why the geometric mean criteria was utilized (see also comment #1). Will attainment of this criteria also lead to the attainment of the other two criteria? If it would not, the TMDL would not be approveable.

Response: *The Geometric criteria is the most stringent of the three criteria outlined in the document. If the geometric criteria is achieved, water quality standards will be met.*

Comments 7 - 11 do not need to be addressed in order for the TMDL to be approved. Addressing these comments, however, will make the TMDL easier to understand and easier to implement.

7. Bacteria Standard Revision Process. Please briefly explain the revision of the bacteria standard, what the purpose standard is, when it will become effective, and how the transition to the new standards will effect this TMDL. If any E. Coli data are available, it would also be useful to include discussion of how the data compares to the new standard.

Response: *E.coli data is provided in Appendix C. The new E. Coli standard is currently proceeding through the public review process. It is expected the Idaho Legislature will address the proposed changes during the 2000 Session. Not enough information is currently available to compare E. Coli information to the proposed rule changes.*

8. Table 11.
   a. Table 11 indicates a target load in excess of the current load at LPR-001 and LPR-002. The increase allowed under this TMDL should be reflected as a negative reduction in the last two columns of the table. This allowed increase appears to be inconsistent with the information provided in the top line of Table 7, Appendix F which indicates that the spreadsheet calculations started at a target level of 33 CFU/100ml (the current level in the river at LPR-002). If upstream sources are allowed to increase their load, this increase needs to be accounted for in Table 7, Appendix F.

Response: *Modification to the Tables have been made. Loading allocation and capacity loads have been adjusted to take in reductions for bacteria along the entire reach.*

   b. Since the upstream target is expressed in CFU/100ml, it would be helpful if a column were added to Table 11 which showed the target in stream concentration at each river station. Alternatively, an attached table provides an example format that may be useful for this TMDL, as it includes point and non-point sources, and allow for expression of concentration and load.

Response: *All loading analysis are now in CFU/sec to reduce confusion. Appendix F does show the expected load achieved, and the bacteria level that would correspond with that load.*

   c. The loads expressed in Table 11 and those calculated in Appendix F appear to differ by several orders of magnitude. Percent reductions noted in the two locations also appear to differ.

Response: *Loading allocation have been adjusted, and those load allocation found in Appendix F, should correspond with the calculations found in Section 4.0.*

9. Margin of Safety. The relationship between the 84% reduction calculated in Appendix F, Table 10 for the mouth of the Payette River and the average percent reduction 79% in Table 11 is unclear. Instead of considering this difference as a MOS, my inclination (without additional information) would be to conclude that a 79% reduction throughout the basin would not meet the 84% reduction needed to attain water quality criteria. If these two reductions are displaying two separate things, they should not be used for comparison purposes in defining MOS. (The discrepancy may actually stem from the fact that the numbers in Table 11 do not appear to be consistent with those calculated in Appendix F - see comment 8c above.)

Response: *A new reduction targets (%) have been calculated (84%). Margin of safety is not represented by the expected die off of bacteria from the up-river stations to the confluence with the Snake River.*

If August represents the critical condition, its use may provide a MOS for the other months but not August. Since the TMDL is required to be written to attain standards at critical conditions, the MOS must also apply during that critical condition.

Response: *See above response.*

The text, p.48, indicates that the 2% die-off rate was used since it was the rate determined for the Boise River, a river system very similar to the Lower Payette River. There is no indication provided in this description which suggests that this is a conservative estimate.

Response: *It would be expected that the die off rate would be greater than 2%. The 2% die off rate is calculated under ideal condition for bacteria survival. However, the reference to this die off rate being conservative has been removed.*

10. Tributary Concentrations. From data presented in Table 12, p.47 and Appendix F, Tables 7-10, it appears that there currently are exceedences of the water quality criteria in many of the drains which are tributaries to the Lower Payette River and that many of these exceedences are still projected to occur under the TMDL. It is my recommendation that these be dealt with in the current TMDL so that another TMDL will not need to be written in the future. However, if this is not done, the data should be considered during the next 303(d) listing cycle and the tributaries which exceed the criteria added to Idaho's 2000 303(d) list.

Response: *The State of Idaho does not believe the man-made conveyances are subject to criteria for primary and secondary contact recreation. However, new load allocations will*

achieve both criteria for primary and secondary contact recreation.

11. Waste Water Treatment Plants. Appendix E should include a summary of the bacteria concentration that is typically discharged from each plant. Lagoon retention time is not typically an effective way to reducing bacteria levels, as is stated on page 39.

Response: Tables in Section 4.0 now show the current discharge from the municipal WWTPs under current conditions, along with expected loading under both the most stringent and less stringent.

Ron Brooks
Idaho Soil Conservation Commission

I believe there needs to be more discussion in the text about the nutrient concentrations measured in 1996, 1997, 1998. At present, these data are neither discussed in the text nor referenced as being in the Appendix. After reviewing these data, it is my opinion that the measured nutrient concentrations provide stronger evidence that nutrients are impacting beneficial uses than does the rationale used in the document (DO and Chlorophyll a monitoring) to conclude nutrients are not impacting beneficial uses.

Response: More discussion of the nutrient data has been incorporated into Section 2.6.

On page 33 you state "...nutrient concentrations are at levels that may cause nuisance aquatic growth." You also provide EPA's recommended criteria for total Phosphorus and Nitrates, concentrations that if exceeded, may cause excessive or nuisance aquatic growth. According to the data in the Appendix, 61 samples from LPR-001 to LPR-008 contained Phosphorus concentrations exceeding the 0.1 mg/L criteria, with the majority occurring from LPR-004 to LPR-008. On 29 occasions, the nitrates criteria of 0.3 mg/L was exceeded, the majority of which occurred from LPR-007 to LPR-008.

I believe it is safe to assume that if there is nuisance aquatic growth, then there would also be impairment of beneficial uses; at a minimum an impairment of primary and secondary contact recreation. I also believe these data provide strong evidence that the nutrient concentrations measured from 1996-1998 were at levels that may cause nuisance aquatic growth, at least in portions of the river. Unfortunately, this growth could not occur and impairment of beneficial uses could not be shown due to the record flow conditions during much of the sampling period. However, under normal flow conditions, I think impairment of beneficial uses caused by excessive nutrients would be quite easy to document on the Lower Payette River. Therefore, I think serious consideration needs to be given to the flow conditions under which the monitoring was completed, especially when determining whether or not the beneficial uses have been impaired, as these conditions do not accurately represent the effects that pollutants of concern have under normal conditions on the Lower Payette River.

I hope these comments are useful. I realize that nutrients will have to be addressed under a load allocation once the Brownlee TMDL is finished. However, I think we can be further along in meeting the Brownlee allocation if we include a load allocation now for nutrients in the Lower Payette TMDL.

Response

1. *The subbasin assessment was prepared using the best available information. This information indicated that nutrients are not currently impairing beneficial uses in the Lower Payette River. However, data from the Idaho Power Company show the lower Payette River contributes between 15-25% of the annual total phosphorus load to the lower Snake River. In-reservoir modeling of Brownlee Reservoir has indicated nutrient and algae loads (phytoplankton) have degraded the water quality. Input from the Snake River, to Brownlee Reservoir has been shown to cause depressed DO concentrations resulting in fish kills during low water years. The completion of the lower Snake River and Brownlee Reservoir TMDL is currently scheduled for the year 2001. Load reductions for nutrients in the Lower Payette River will be evaluated at that time. The Lower Payette River will continue to be listed on the federal Clean Water Act §303(d) list for nutrients. A proactive approach utilizing a watershed management plan for pollutants not addressed by the TMDL as well as ongoing implementation will place the lower Payette River in a favorable position for the subsequent load allocations which could be imposed from the Lower Snake-Brownlee Reservoir TMDL in December 2001.*

Ron Brooks
Idaho Soil Conservation
(2nd letter with comment corrections?)

I believe discussion of the in-river concentrations measured for nutrients from September 1996 through October 1998 needs to be added to the text. These data are in the Appendix, but not mentioned in the text. Perhaps giving at least the ranges measured for total-P and NO_2-NO_3 would be appropriate, much like what was done for the 1976 nutrient data discussed on page 34.

Response: More discussion of the nutrient data has been incorporated into Section 2.6.

Page 26, section 2.2, fourth paragraph. "A narrative criteria prohibits ambient concentrations of certain pollutants which may impair beneficial uses." My interpretation of this statement, in conjunction with the narrative standards for nutrients, "Surface waters of the state shall be free from excess nutrients that can cause visible slime growth or nuisance aquatic growth impairing designated or protected beneficial uses..", is different from what has been presented in past meetings concerning nutrients. The rationale used to conclude a TMDL is not needed for nutrients because it was not "demonstrated" or "proven" that nutrients are impairing the beneficial uses of the Lower Payette. The statement on page 26 and the standard for nutrients imply that proof of impairment of beneficial uses is not required in order to exceed narrative State of Idaho Water Quality Standards. These

statements imply there could be violation of narrative standards if pollutant concentrations are such that there "may" or "can" be impairment of beneficial uses. I believe that the data shows that nutrients are at such concentrations in the Lower Payette. Please provide clarification.

Response

See response #1.

Executive Summary, page 3, first paragraph. "It is also recommended that nutrients be removed as a pollutant of concern for the Lower Payette River". In light of the fact that 60 percent of the samples for total-P and 41 percent of the samples for NO_2-NO_3 at the mouth of the Lower Payette River exceeded EPA's recommended criteria for nutrients and the fact that the WAG voted to support a Watershed Management Plan calling for a voluntary 10% reduction in nutrients, I do not feel removing nutrients as a listed pollutant of concern is justified. As stated on page 36, "...nutrient concentrations are at levels that can cause nuisance aquatic growth." I believe there is ample evidence to show nutrients are a concern on the Lower Payette River.

Response

We have removed the sentence referenced on page 3 of the Executive Summary.

Claude Bruce
Payette Soil and Water Conservation District

It is our mission to provide local leadership on the conservation and protection of Payette County's natural resources. The PSWCD has and continues to set objective and proactive goals to address the water quality concerns we feel are valid on the Lower Payette River. In light of this, the PSWCD unanimously feels that a TMDL for nutrients is warranted on the Lower Payette River. We believe that the conclusions made in this document concerning nutrients are inconsistent with our interpretation of the data in the appendix and our existing goals for nutrient reduction on the Lower Payette.

Response

See response #1

Michael A Raymond
USDA Natural Resource Conservation Service

Idaho's water quality standard for nutrients as provided on page 34 of the document states that "surface waters of the state shall be free from excess nutrients that can cause visible slime growths or nuisance aquatic growth impairing designated or protected beneficial uses...". This standard says nothing about dissolved oxygen or chlorophyll-*a* concentrations, nor does it link the determination

of the effects of nutrients on beneficial uses to these components, at excessive levels. On page 36, the document states that "nutrient concentrations are at levels that can cause nuisance aquatic growth". It seems to me that this statements supports the concept that the state water quality standard for nutrients had been exceeded on the Lower Payette River. With nutrients at these levels, all that is needed is the right combination of conditions for impairment of beneficial uses to occur. Failure to address nutrients as part of the TMDL simply supports continued ignorance of this situation.

Response

See response #1

2. *The data available and the monitoring performed by DEQ during the development of the subbasin assessment showed no evidence of visible slime growths or nuisance aquatic growth which would impair any of the beneficial uses in the Payette River. With that in mind, the DEQ performed 24 hour diurnal monitoring during two water years to determine whether algal productivity was significant enough to cause a "crash" in the dissolved oxygen concentrations at night. While the dissolved oxygen concentrations dropped at night due to algal respiration, the concentrations remained above 6 mg/L, the water quality standard for cold water biota.*

   In summary, impairment of the beneficial uses in the lower Payette River is due to several factors.

   - *Cold water biota, i.e., a self sustaining trout population, is limited by warm temperatures, lack of adequate habitat, and flow alteration. Dams and diversion structures also interfere with migration patterns of trout species to historic spawning areas.*

   - *Primary contact recreation is limited due to levels of fecal coliform bacteria which exceed water quality standards in some sections of the river.*

My original comments concerning the sub-basin assessment (SBA) dated March 12, 1999 are contained in the appendix of the report. I feel that these comments remain valid, and since they are published in the document I will not restate them. However, I will take this opportunity to reply to some of the responses to my comments, as I have not had that opportunity provided to date.

Concerning the summary and explanation of data contained in the appendix of the document: The analysis of any data is of little value unless it is explained. This is especially true for the layman who attempts to interpret it.

Response: More discussion of the nutrient data has been incorporated into Section 2.6.

Concerning the aesthetics of the river: Once again, please let me know if there is a more formal process required to notify DEQ of a complaint regarding the river's aesthetics. Thank

You.

Response

Other forms of subjective analysis suggested by the DEQ has been scrutinized heavily and criticized a great deal in the past. There are no immediate plans to survey the public about the aesthetic qualities of the lower Payette River.

> Concerning the "general relationship between fecal coliform and sediments": I reviewed the *Lower Payette River Agriculture Irrigation Water Return and Ground Water Evaluation"* (Ingham, 1996) and found no mention of a correlation between these variables. Please let me know if I somehow overlooked something.

Response:

> Concerning my remaining comments: Thank you for your responses. My concern regarding the exclusion of nutrients from the TMDL is stated earlier in this letter.

Scott Brown
Idaho Conservation League

Nutrients

Information presented in the subbasin assessment makes the case that nutrients are a very real problem in the lower Payette River and yet, a nutrient TMDL is not proposed.

See response #1

It does not appear that DEQ has even attempted to determine compliance with Idaho's narrative nutrient standard.

The data available and the monitoring performed by DEQ during the development of the subbasin assessment showed no evidence of visible slime growths or nuisance aquatic growth which would impair any of the beneficial uses in the Payette River. With that in mind, the DEQ performed 24 hour diurnal monitoring during two water years to determine whether algal productivity was significant enough to cause a "crash" in the dissolved oxygen concentrations at night. While the dissolved oxygen concentrations dropped at night due to algal respiration, the concentrations remained above 6 mg/L, the water quality standard for cold water biota.

A post-Brownlee reopener clause would be appropriate.

Agreed. This will be incorporated into the Executive Summary.

Aesthetics

Other forms of subjective analysis suggested by the DEQ has been scrutinized heavily and criticized a great deal in the past. There are no immediate plans to survey the public about the aesthetic qualities of the lower Payette River.

Temperature

The subbasin assessment makes it clear that high water temperatures are exceeding state water quality standards and are likely to be impairing beneficial uses. However, no TMDL is proposed.

DEQ is currently reviewing the water quality standards for temperature statewide. Warm water temperatures coming into the watershed from Black Canyon Reservoir which exceed the maximum daily standard for cold water biota (from August 1 through September 26, 1999 in 25% of samples) make this problem very difficult to resolve within the scope of this project. Other factors which exacerbate the already warm water temperatures are irrigation return flows and diversions, modification of the river channel which prevents the establishment of an appropriate pool-riffle ratio, removal of riparian vegetation (shading) and the river's lack of access to the historic

floodplain which would provide cooler groundwater storage and recharge. With the above factors in mind, the DEQ will not attempt to allocate loads for temperature in the lower Payette River at this time.

Habitat and Flow

The DEQ has suggested that difficult issues such as impairments due to degraded habitat and flow conditions, will be addressed at the implementation stage and, therefore, do not need to be addressed in the TMDLs themselves. ICL strongly disagrees.

With reference to the 1998 Federal Advisory Committee (FACA) Report, it must be pointed out that the committee is advisory in purpose. Referring to the approval letter from the EPA to the Oregon Department of Environmental Quality, May 4, 1999, for the TMDL for the Sucker-Grayback TMDL, it states, "Neither flow modification nor habitat modification are identified as pollutants under §304(a)(2)(D) of the Clean Water Act. Therefore, EPA is taking no action to approve or disapprove the TMDLs submitted for flow modification or habitat modification." During the course of the implementation planning, the stakeholders in the watershed may determine that habitat improvements or changes in flow regimes released from Black Canyon Reservoir are appropriate measures to assist in the attainment of full support of beneficial uses.

Wild Fish

A more thorough analysis of spawning conditions and the status of various wild fish species in the lower Payette River is necessary.

We agree that minimal fisheries information exists for the lower Payette River. However, the limited information that exists indicates that there is not a self sustaining trout population. The physical characteristics of the river which include warm water temperatures, lack of adequate habitat, and flow alteration appear to be likely reasons for the lack of a self sustaining trout population. Certainly, dams and diversion structures interfere with migration patterns of trout species to historic spawning areas thus limiting their ability to successfully reproduce. Lack of gravel recruitment from the upstream impoundment also limits available substrate to either cobble or fine material in the stream channel. With these factors in mind, it would appear that even though fisheries data is limited, there is a good understanding as to why spawning by trout species in the main stem of the lower Payette River is not a supported beneficial use.

Sediment

Sediment is not a listed pollutant for the lower Payette River. However, the subbasin assessment indicates that sediment inputs are related to the other pollutants listed for the river. The implementation plan developed for the watershed will initially address bacterial contamination, and reductions required for this pollutant will be beneficial in reducing sediment loads. Upon completion of the lower Snake River-Brownlee Reservoir TMDL, assigned reductions in nutrient loads will also reduce sediment. Additionally, during the implementation phase of this project

additional monitoring will enhance our understanding of sediment in the river and whether or not it plays a role in impairment of beneficial uses.